SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Original Correspondence.

OUR COAL FIELDS.

Sir,—There is, probably, no subject which has recently been discussed by geologists, mineralogists, political economists, or statists, more important than the area and probable duration of our coal fields. The consumption of coal proceeds in a rapidly accelerating ratio. The increase of population necessitates an increased consumption for domestic purposes. The accessions to the numbers and means of the people enlarge the request for home use of our manufactures, and the greater production of these creates an extended demand for mineral produce, especially that of our coal mines. The use of iron for ships, and for a thousand purposes until lately unknown, calls for coal to feed the furnaces by which the iron must be supplied. The extraordinary advance of our foreign trade, and the facilities, always growing, for foreign interchange, accumulate incessantly the requirements upon our means—more especially resulting in a large export of coal, which is likely to be much larger still. Formerly ships were wafted to their destinations by the winds, and the ever-useful horse was the only power by which land travel could be conducted; now *coal* propels the commerce of the sea, moves the huge iron-clad war ship in its hostile revolutions, and runs upon the rails the engine which draws after it the passengers and the merchandise passed from one inland emporium to another. This is true, not only of Great Britain but of every civilised country, and of some which are very imperfectly civilised. Spain, the Africa of Europe, with all its turmoil and its prejudices, has laid down excellent lines of railway, has commercial steamships, and an iron-clad, steam-driven military navy. Russia, although tramroads would suit the greater part of the empire better, is full of zeal at present for the rail; and in the more civilised portions of European Russia the engine supersedes, and will still supersede, the hardy native horse. Even in the land of the lazy Osmanli there is enterprise enough to promote railway communications, and notwithstanding that all new scientific principles—or the discovery, rather, of the application of principles eternally existant—is opposed to the doctrine of the Koran, and comes under the interdict of "the Prophet," the iron-clad war ship lits frowning by the Golden Horn, and displays the power of steam, and contributes to the consumption of coal, beyond the gates of the Bosphoros. The Sultan has his steam squadron in the Mediterranean, and in the Greek Archipelago, and with this power has his sentinel ships by the lips of the Euxine. India has seen but little as yet, notwithstanding recent achievements, and Government guarantees, of railways and steam flotillas, compared with what will unite the territories and course the rivers of the vast regions of which Queen Victoria is empress, and of contiguous realms, comprising regions yet more vast. It is obvious, then, that the consumption of coal must increase beyond all its past expenditure, even should it rise very much in price, so long as it can possibly be obtained. The facts of recent and present shipments from England prove that the draw on our coal resources augments from year to year and from month to month. Take the last annual returns in exemplification. In the year 1866 nearly 10,000,000 tons of coal, cinders, and culm were exported by us; in 1865 the export was 750,000 tons less. A dozen years ago the amount of exports of this class in tons was scarcely half what it was last year! An increase of foreign demand in such a ratio cannot be calmly contemplated without arriving at the conviction that unless our resources be practically unlimited it cannot long be met. The number of places to which coal is exported becomes greater in every decade—indeed, in every few years. France, Spain, Italy, Holland, Hanover, the Hanse Towns, Prussia, Turkey, Moldavia, Wallachia, Russia, Denmark, Sweden, Norway, Egypt, Aden, British India, China, &c., have all been customers, and are likely to continue such; and France especially enlarges her imports from us of this great staple commodity. Since the annual returns were published the augmenting process has gone on. In July last the export was 925,031 tons, in July, 1866, it was 870,092 tons. Taking the seven months of this year ending on July 31, and comparing them with the corresponding months of last year, the increase in the export of coal and coal products is considerable. This was not caused by some unexpected need, in some one great coal-burning country: it was general. France, Holland, Germany, and the East received it from us. Russia will soon become a much larger importer of this article of traffic. The advancing exports of iron and steel exclusive of iron and steel manufactures, will create a proportionate demand for coal to work them in the countries to which they are sent. Thus past experience, present and passing events, and probabilities as to the future point out an increasing demand for coals, at a ratio which, perhaps, no one can calculate. Can this overwhelming drain continue, and the supply keep pace with it forever? Alas no, so far as our coal fields now actually wrought are concerned. The time can be computed when, at the present rate of consumption, or at an aproximately increased rate, the coal beds will cease to render up the treasures which so long slept there, awaiting the providential period when the hand of man should reach them, and bring forth the latent heat and light poured upon them from the sun long ages back, when organised in multitudinous forms they drank in his rays.

The question is one of life and death for the commercial greatness of Britain. Whatever may be said of British talent, energy, and perseverance, there is force in the remark made some time ago by Prof. Huxley, that we owe quite as much of our greatness as a nation to the possession of coal and iron as we do to the moral, mental, and physical qualities which characterise us.

The British Association, when it met at Birmingham, was naturally reminded by the locality of the incidence of the question, and by discussing it gave an impetus to the enquiries which have been since set on foot. The prevalent opinion in the district then was, and still is, that unless extensive discoveries are made the whole of our coal fields will be exhausted in the third generation. Various learned bodies have displayed anxiety to arrive at correct data for a definite opinion. Probably the first note of alarm—at all events, the first which really awakened apprehension—was sounded by Mr. Matthews, in 1860, when he lectured in Birmingham before the Institute of Mechanical Engineers. He declared that in forty years from that period the whole of the coal fields would be exhausted. Mr. Henry Johnson read a paper before the British Association in Sept., 1865, in which he declared that the coal fields worked in the Midland Counties could not last twenty years. More recently many authorities have discussed the subject, without, however, leaving the matter more definite or encouraging.

Notwishstanding these depressing statements and gloomy forbodings, there is hope that the coal fields of Great Britain will last for a very much longer period than the vaticinations of our mineralogical prophets would allow. Mr. Johnson, and other gentlemen of geological authority, since have maintained that it is to the confines of the present coal fields that hope must be directed for supplies. On the eastern boundary of the great midland coal field opinion prevails that the coal lies too deep to be worked with profit, but coal was found in the neighbourhood of West Bromwich at a less depth than has been successfully worked in Belgium, and even in the North of England. Looking at the midland coal field as a whole, there has been much encouragement during the last dozen years to prosecute experiments for coal finding. A great number of new winnings have been made in the north end of Cannock Chase district, as also in the north-east of Aldridge, and at other places. Trial sinkings, with very important results, have been made on the south end of that coal field in the neighbourhood of Hales Owen, Congreaves, Cradley Park, and Wassell Grove. The scheme for proving the continuity of the coal field underneath the Permian, on the down-throw side of the great western boundary fault at Essington, has already conduced to present success and hope for the future. The whole Permian districts lying between the South Staffordshire, Warwickshire, and Shropshire coal fields should be explored upon a grand and extensive scheme. So far the additions made to our supply in that region only postpones the day of evil, but it is possible that where the great faults occur in the midland districts, and where geologists believe that the great coal beds had been denuded in the processes of geological change which occurred long ages gone in the distance of time, by deep digging coal will be found beneath the Permian.

One of our chief hopes for the future is in the imperfect knowledge of geology now existing. Various events have come to light lately in reference to coal finding which staggers our faith in the dicta of the geologists. A surprising discovery has been made in the gold fields of the Canterbury district, New Zealand, which seriously affects some of our accepted theories of the order of geological formations—the close association of coal with the precious metals. The statement which reaches us is that—"A seam of coal has been discovered in the Canterbury gold field. *It is of great thickness*, and is so situated that it could be worked from a drive without the slightest difficulty." As there can be no reason to doubt the authority upon which the evidence of this fact rests, it leads to the conclusion that the more we see of the earth's crust, over extended areas, the more are we puzzled in arriving at a settled principle as to the series of the various formations. It is not surprising that in view of this discovery the remark should be made—"The title page of the science may hardly be said to have been yet written." According to the *Inverness Courier*, a discovery of coal has been made at Strathpeffer, on the Sutherland estate, in the Highlands, contrary to all the acknowledged canons of geology. The rocks at Strathpeffer are generally believed to belong to the Old Red Sandstone, and deep in that formation, and no beds of valuable coal have been hitherto found so circumstanced. Very recently a most important discovery of coal was made on the Clifton estate, at Nottingham, where it was the general opinion of geologists and of practical coal miners that none would be found. Sir Roderick Murchison, however, declared twenty years ago that the mineral would be obtained there. We believe this opinion was not made public, but it was undoubtedly pronounced. Still the general notion among theoretical and practical men was that there was no coal beneath the Clifton estate. We have hope that the South and South-East of England will yet yield a supply. There are many grounds of discouragement. Some years ago certain scientific gentlemen bored in every direction in the great London basin for purposes in connection with the London water supply, and they pronounced that no coal existed. Yet an examination of the coal fields of Belgium, and of the mining and geological phenomena of Somersetshire, give reason to suppose that the former extends across the country south-east and south-west of England. However little the hope that coal will be discovered in Kent, there are sufficient reasons to render it reasonable and expedient to make sinkings in Sussex. Coal was obtained in Surrey a long period back, but the site is lost. In view of the vast, the vital importance of this matter, the Government should make experimental sinkings, especially in portions of Surrey and in Sussex, as the expense would be too great for private enterprise. A small portion of the money squandered on useless fortifications, and other public matters much less justifiable, would settle this great question.

Unless the discoveries made be extensive, and we must hope for such in the part of the country referred to, the day will not be far off when Great Britain, whatever her destiny, must cease to be what she now is. She will no longer reign upon her throne of Iron—richer in her collieries than all the gold and silver mines in the world could make her.—*London*.

Civis.

THE DARIEN CANAL—No. IV.

Sir,—As it would not be practicable at all times to sail into a canal direct from the open sea, safe anchorage must first be obtained very near its entrance, and that opening must itself be perfectly protected, not only from injury from land floods, but from the effects of storms, from the surf and heavy swell of the sea, and from any accumulation of mud, sand, or shingle. Delays, dangers, difficulties, and expense would be the consequences of using a canal not provided with the adjunct of a good harbour at each end, and such a canal would not answer the requirements of commerce. For any line, therefore, by which it may be proposed to effect the junction of the two oceans, the *sine qua non*, the first preliminary and indispensable requisite, is that it should have at each terminus a good harbour, capable of affording a secure anchorage at all times, and in both the rainy and the dry season, safe and sheltered from all winds, having sufficient capacity and depth of water, and easy of ingress and egress. The following description will, I trust, sufficiently prove that the Darien route is adequately provided with secure harbours at each end.

On the Atlantic coast a series of good anchorages extends continuously for 12 nautical miles from S.E. to N.W.—namely, Port Escoces, 2¼; Caledonia Bay, 3½; Caledonia Harbour, 2¼; and the Channel of Sassardi, 3¾ miles in length. All these have great depth of water, the least being 6 fms. They are so extensive and (with the exception of Caledonia Bay, which is an open roadstead) so perfectly sheltered that whole fleets might ride safely in them.

Port Escoces is a noble barbour, with from 6 to 9 fms. water, over a bottom of sand, except in its innermost part, where the water shoals to 3 fms. It extends inwards 2¼ miles, with a breadth of from ¼ to ¾ of a mile. It is very safe, being protected from the winds and waves by a promontory, on the inner side of which the Scotch colonists of 1698 built the town of New Edinburgh, and the fort of St. Andrew. The summit of the promontory is 580 ft. high, and the hill at its point 260 ft. Both are covered with forest. The latter was named Patterson Hill by Commander Parsons, of H.M.S Scorpion, as it was from its top the colonists were accustomed to look over the sea in the evening in the direction of Scotland. I was the first to point out the site of the Scotch settlement, and in 1854 I brought Dr. McDermott, of H.M.S. Espiegle, to search for the canal which the colonists dug around the fort, but it was dark before we reached the place. Dr. McDermott afterwards returned, with Commander Parsons, and they found the canal quite perfect. It is 130 paces in length, cut angularly as a fortification, and has an embankment on the inner side. Its north entry, 8 ft. deep and 12 ft. wide, is cut through rock. They could find neither graves nor guns. Some mounds, which may be the ruins of houses, indicate the site of the town. Several rivulets fall into Port Escoces, and offer facilities for watering. Their water, and that of the rivers of Darien in general, is clear, cool, sparkling, and delicious.

The entrance to Caledonia Bay is between Point Escoces and Isla de Oro, or Golden Island, which bears from the former N. 40° W., distant 4 miles. From this line it falls inward about 1¾ mile. It is clean, and has great depth of water. The greater part of its shore is a beach, near the middle of which disembogue the rivers Aglatumati and Aglaseniqua.

Point Escoces is 7 miles N.W. ¾ W. (N. 48° W.) of the point at the entrance of Carreto Harbour.

Golden Island is wooded to the summit, which is 470 ft. high, and has a cliffy appearance at the base and sides. It has a rivulet of clear water, and a landing place at the south side. Lionel Wafer, the surgeon of the Buccaneers, and Capt. Bartholomew Sharp stopped on this Island for 15 days in the year 1680. At about 1½ mile south of Golden Island, is a smaller one, named San Augustin, or Ascension Island, on which there is a large space covered with a mass of bricks and tiles, the ruins of a magazine which the Spaniards built in 1785, and from which it derives its Indian name of Kinkitopoo, or Gunpowder Island. It is interesting as being the place where the treaty of peace between the Spaniards and Indians was signed, on June 9, 1778. It was cleared in 1854 by Captain Hollins, of the U.S. corvette, Cyane, to receive the jackasses which Lieut. Strain had brought down from New York, under the erroneous impression that there was a bush path across the Isthmus by which his party could ride over to the Pacific. Piedras Islet, so named from the rocks close to its shores, is rather more than a cable's length south of San Augustin.

In Caledonia Harbour, between San Augustin and the three large Sassardi Islands, which are to the N.W., are Dobbin Cay, Espiegle, Cyane, and Chimere Islands, and Scorpion Cay. The four last were named by Parsons after the vessels of war that were engaged on the Darien expedition which was sent out, in 1854, to render aid to the engineers of the Atlantic and Pacific Junction Company in the survey of the route, but was designedly mismanaged, to subserve the interests of the promoters of the opposition project—*via* the Atrato—which was subsequently found to be impracticable.

The Aglatumati River has a course about 12 miles from S.E. to N.W. Its mouth is about 50 ft. wide, and has a bar with very little water on it, but inside there is a depth of 8 ft. About a mile up it is shallow enough to allow one to wade along, being only knee deep in the dry season, but in the rainy season the depth is considerable and the current very strong, and during floods it rushes down with great impetuosity and a roaring noise. At its mouth there are five bamboo huts, in one of which an old Indian, whose adopted name was Robinson, resided in 1850. On the arrival of the expedition the Indians abandoned them, and they were occupied by some of the New Granadian soldiers and convicts brought from Carthagena by Col. Codazzi. About three miles up it receives a large tributary on the left hand side, and on the point between there is a rancho, or shed, for Indians passing from Caledonia Bay to the Sucubti or Chucti to rest at. About two miles higher up it is joined by a small stream on the right hand, on the further bank of which is the village of Agla, consisting of about 18 huts, with a population of about 60. It had just been abandoned when Mr. Gisborne and party arrived there in 1854, the Indians having fled through fear of the white men. The principal man of the place was Juan Seva, so named after a Malaga man, who traded for 28 years from Carthagena to the Darien coast, but never once landed on it. On the lower bank of the above stream there is a large cocoa plantation, from which a trail leads for about 300 yards to the foot of Mount Agla, which rises quite suddenly. The summit is 926 ft. high, and very narrow, and the ascent to it is rather steep. The descent is more gradual on the other side to its foot, where the Forti unites with the Sucuoti, the waters of which flow into the Pacific. This is the trail by which the Indians cross the Cordillera to Sucubti village, by which they guided Vasco Nunez in 1513, the Buccaneers in 1680, and the Spanish adjutant, Manuel de Milla, in 1788. It was by the same trail that Lieut. Strain, and Mr. Gisborne some time after him, crossed in 1854, and it was through Mount Agla that Mr. Gisborne reported that a tunnel would be necessary. *But this is not the line that had been proposed by me*, which, as will be explained, is some miles to the N.W. At the mouth of the Aglatumati, from whence Vasco Nunez had started on his eventful journey, the settlement of Acla, or Agla, was founded by Gabriel de Rojas in 1514. It was fortified in 1516 by the orders of Pedrarias Davila, but, owing to the opposition of the Indians, who were then numerous and warlike, the Spaniards abandoned it in 1532 for Nombre de Dios, whence they opened a bush path to Panama. After the expedition of Drake the Atlantic terminus of the transit line was removed to Porto Bello, which was also given up for Chagres, and that for Aspinwall, or Colon, in Navy Bay, the terminus of the Panama Railroad. The Buccaneers, under Basil Ringrose, Barty Sharp, William Dampier, and Richard Sawkins, with whom was surgeon Lionel Wafer, of London, made the Aglatumati mouth the starting point of their expedition to the South Sea. The same place was afterwards selected by General Arebalo for the erection of the fort of San Fernando de Carolina, built in 1785, and abandoned in 1790, the site of which is indicated by a grove of cocoa-nut trees, and some tiles and bricks. A large quantity of the latter was brought to Carthagena, where the father-in-law of Juan Seva built a house with them.

The Aglaseniqua is 20 feet wide at its mouth, which has a bar with only 2 ft. of water on it. Inside the depth is 8 ft., and half a mile up 5 ft. It is totally uninhabited. Both this river and the Aglatumati were traced up to their sources by different parties, in the vain expectation of finding a low pass from them across the Cordillera.

Caledonia Harbour, a most secure haven, extends from a line drawn between Golden Island, Piedras Islet, and San Fulgencio Point to the Mangrove Cays to the west. Its S.E. entrance is off and on, with four cables' length in extent from edge to edge, and with from 9 to 12 fms. depth on oaze; and further in from 8 to 10 fms. Between the curn of the bank off Piedras Islet and Caledonia Bay the depth is from 7 to 15 fathoms; and the piece of sea which intervenes between this harbour and Port Escoces is of a good depth; but at a short mile S.E. by E. ½ E. (S. 55° E.) from Piedras Islet the sea breaks when the breeze blows fresh. The harbour is sheltered from the winds and seas of both seasons, and has good depth throughout. It is ¾ mile wide, and 2½ miles in extent from its entrance to a narrow bar which separates it from the Sassardi Channel.

The Point of San Fulgencio is salient, scarped, and clean. Immediately behind it rises an isolated hill, 200 ft. high, which Parsons named Mount Vernon. Just inland of it Captain Hollins bored a well through a stratum of dolomite, or magnesian limestone.

Immediately inside, or to the N.W., of San Fulgencio Point is an indent, or little bay, which falls inwards a half mile from a line drawn between San Fulgencio and the western point, and is a mile in length from S.E. to N.W. Its western side is bordered by some mangrove cays. This haven is so "snug" that it would be the most eligible place for the entrance of the canal. To adapt it for the passage of ships, it would only be necessary to remove a few little shoals, and to deepen it to 30 ft., for a quarter of a mile from the shore, in which space it has only from 12 to 24 ft. of water.

The depth of water close in shore is much greater, however, to the west of this bight. The inner part of its western extremity is in lat. 8° 53′ 45″ N., and long. 77° 43′ 30″ W. At the N.W. end of Caledonia Harbour, 2¼ miles N.W. of San Fulgencio Point, and in a line with the bar which separates it from the Channel of Sassardi, a considerable river, with 8 ft. of water at its mouth, falls into the harbour. This river traverses the valley between Agla and Sassardi, the parallel mountains of which the Cordillera, inland of Caledonian Harbour, consists. The watershed between it and the Sucubti is the lowest summit level between the two oceans, and, therefore, the careful examination of this river will be of the utmost importance in the survey about to be made.

Captain Marivault, of the French frigate, Lucifer, who visited Caledonia Harbour in 1860, says of it:—"This harbour is magnificent, and no one could desire a better point for the entrance of a ship canal. To the north of San Fulgencio Point the sea is perfectly calm."

The Channel of Sassardi is between the coast and the three Sassardi Islands, the aggregate length of which is 3¾ miles. Its entrance, which is between the point of the N.W. Island and the Fronton of Sassardi, is three-fourths of a mile wide. The latter is a round, scarped promontory, surrounded by reefs close to the shore. The total length of the channel, from its N.W. end to the bar be-

tween it and Caledonia Harbour is 3¾ miles. Commander Parsons says, in his "Sailing Directions"—"Sassardi Harbour is a fine sheet of water, being 1½ mile long and ¾ mile wide, with an average depth of 6 fms. throughout, excepting a few shoals nearly a wash. It is joined to Caledonia Harbour by a narrow bar, of 12 ft. This Mr. Gisborne bored, and found it could be easily removed, having penetrated into marl 15 ft. If cut through it would make a clear communication, with the advantage of a double entry, to the harbour." Into its N.W. extremity falls the River Sassardi, at the mouth of which is the village of the same name, consisting of 15 huts, with a population of about 50 Indians, the chief of whom was formerly a very old man, named John Bull, who was succeeded by Denis, who died in 1856. Between it and the river of Caledonia Harbour two other streams fall into the Channel, one of them being from 6 to 10 ft. deep at its mouth, the water in which is salt.

The engineer has a wide scope for selecting a locality for the entrance of the canal, which may open anywhere in Caledonia Harbour or the Channel of Sassardi. Parsons says:—"There are several points which are favourable for the entry of a ship canal, having deep water in close proximity to the shore, with protection outside." That which I would recommend is the bight N.W. of San Fulgencio Point. In Caledonia Bay and Port Escoces there are also several points with deep water so near the shore that vessels might lie there as close to the land as they can in the Bosphorus, but they are out of the way, and not sufficiently protected. The rise of tide in the harbours is 1 ft. 6 in. springs, 6 in. neaps. High water, full and change, 11 h. 40 m.

The harbours on the Pacific are even superior to those on the Atlantic side. The outer one is the magnificent Gulf of San Miguel, which is peculiarly adapted, by its position and natural advantages, to afford a safe and noble approach to the future canal. It runs far inland, has great depth, and would hold the shipping of the world. Its entrance is just outside that of the Gulf of Panama, and is 15 miles across, and its extent inwards is 22 miles N.E. The least depth is 6 fms., and through most of its extent the soundings vary from 8 to 17 fms. The tide rises in it from 18 to 24 feet, runs 5 knots an hour, and ebbs and flows N.E. and S.W. It is bounded on the N. by a promontory, two miles from E. to W., the inner point being called Cape San Lorenzo, and the west, or outer, Punta Brava, which is 78 miles S.E. by E. ½ E. of Panama. One mile S. of it is a shoal, called El Buey, which is 1¼ mile broad and ½ mile long, with 6 fathoms close to it. Though far from the track, it should be removed before the completion of the canal. The boundary of the entrance, on the S., is Garachiné Point, a bold headland. Inside of it there is a bay of the same name, where vessels may careen, and behind it rises Mount Garachiné, about 2500 ft. high, said to be rich in veins of gold. At the inner end of the bay the shores of the Gulf approach, its width diminishing to seven miles between Cape San Lorenzo and Morro Patino. It then increases to 12 miles, and again diminishes to Boca Chica and Boca Grande, the mouths of the Tuyra, the principal river of Darien. These discharge themselves into its eastern extremity, which is a bay formed by the islands of San Diego, and called Boca de Provincia, or Ensenada del Darien, 22 miles from its entrance. There are some islands in the Gulf, as Iguana, Cedros, San Diego, &c. They are all safe of approach, and have deep water close to them. The rivers Congo, Sucio, and another tidal creek, Cucunati, Cupunati, Buenavista, Escudero, and San Miguel fall into it on the N.; the Guaca, Taimita, Sambu, Pinuguilla, Garachiné, and San Antonio, into Garachiné Bay; and the Moguey and another into Playa Guadarra, a bay inside of Morro Patino, on the S.; whilst the Tuyra opens into it on the E. On the Sambu, at the sources of which gold has been found, there is a hacienda, or estate, belonging to Senor Bermudez, of Panama. At Taimita mouth there lived some years ago a white man from Venezuela, named Fernando Melo. In Garachine Bay is the village of the same name, with 162 inhabitants, all negroes. Those are the only inhabited places. The Congo is the river which Wafer ascended on his return journey in 1681. From it Lacenta, the Indian chief, guided him to the Chepo, and thence across the Cordillera to the mouth of Concepcion river, near San Blas, or Mandinga Bay, and 60 miles N.W. of Caledonia Harbour. This gulf was named San Miguel by Vasco Nunez de Balboa, because he discovered it on St. Michael's Day, the 29th of September, 1513.

Inside the mouths of the Tuyra is the estuary formed by the united streams of the Tuyra and the Savana, which falls into it from the N.; it is eight miles in length, four miles wide, opposite the Savana mouth, and has a minimum depth of 13 fms. at low water. Boca Chica and Boca Grande, the mouths by which it discharges itself, have each a depth of 12 fms. at low water; this inner harbour is perfectly land-locked. The Emperor Napoleon, on the occasion of my last audience with him, at the Palace of St. Cloud, on Oct. 30, 1859, was much struck with its advantageous position and security, and suggested that it should be named "Port Interieur du Darien." Boca Chica Island, which separates the mouths, is a round, conical hill, about 250 ft. high, wooded to the summit, on which there are the ruins of a fort built about 1790. In 1849 Fernando, or Manchakala, a negro, who left Pinogana, on the Tuyra, in consequence of debt, settled on it with his sons and grandchildren. On the S. bank of the Tuyra, opposite the Savana mouth, an intelligent negro, named Marcado, erected a few huts in 1851, and named the place La Palma. Seven miles above Boca Chica is the mouth of the Seteganti, where there was once a village. Two miles higher up is the village of Chapigana, which had, according to the census of New Granada, taken in 1851, a population of 268, nearly all negroes, governed by two corregidors, or police magistrates. Two Inverness men, Mr. Andrew Hossack and Mr. Robert Nelson, once resided there, and were engaged in wood-cutting. A Portuguese, named José Maria Troncoso, but commonly called Don Pepe el Niopo (the European), who had been a sailor in a slaver, trading between St. Paul de Loando and Brazil, also resided there. On the N. bank, near the E. point of the Savana mouth, there was once a settlement called Escuchadero (the listener or sentinel). It is worthy of note that Tuyra is the name of the devil in the languages of both the Darien and the Caribbee Indians, and that he was worshipped by both tribes. The scenery of the shores of the estuary is magnificent beyond description. The above details will, perhaps, be sufficient to prove that the harbours at each end of the line have all the requisites of good and safe anchorages—security, depth of water, capacity, and facility of ingress and egress, and that they are admirably adapted for the termini of a grand inter-oceanic navigation. The soundings, bearings, &c., will be found in the "Survey of Caledonia Harbour and Port Escoces," with sailing directions accompanying, by Commander Parsons, of H.M.S. Scorpion; and the Survey of the Gulf of San Miguel, by Capt. Kellett, of H.M.S. Herald, in sheet 1, West Coast, Central America, both published by the Admiralty in 1854.

Dublin. E. CULLEN, M.D.

THE NEW PROCESS FOR MAKING CHLORINE.

MR. BAGGS CONFESSING THE TRUTH.

SIR,—Mr. Baggs, "at the urgent solicitation of two chemical friends," whose ideas of what is due to one's word are apparently on a par with his own ideas of the regard which should be paid to truth and fact, has characteristically violated his several times repeated assurance that he would write no more with respect to the process which I described before the British Association at Dundee, and which is now in most successful operation here and at Widnes. In so doing he has abandoned his old ground, and, aided by a patent agent who dates from the same address—54, Chancery-lane—as that which has been appended to Mr. Baggs's own letters, has endeavoured to raise an entirely new contention, which, however, I shall have no difficulty in proving to be as completely false and unfounded as those which have preceded it.

The new contention is that of the three patents which protect in this country the process referred to, one, being the first of the three, is invalid, *not* because Mr. Baggs had practised that process before I did—Mr. Baggs no longer advances *that* claim—but because, to quote his own words, "*the title of this patent* (No. 1948, *date* 1866) *is for 'improvements in making chlorine,' and no improvements in making chlorine are described.*" The short sentence which I here quote from Mr. Baggs's last letter embodies two statements, one direct and the other partly direct and partly implied, both of which, like every other statement made by Mr. Baggs which I have yet examined, are simply *untrue*. The "title of this patent" is *not* "Improvements *in making* Chlorine." It is "Improvements *in the manufacture of* Chlorine," and although Mr. Baggs may not be aware that "in making" and "in the manufacture of" are not synonymous expressions, no other reader of your columns will be similarly ignorant. Every other reader will see, for example, that although the "singeing" of calico by passing it, stretched over rollers, between rows of gas-jets, in order to the removal of all projecting filaments of cotton, is *not* an "improvement *in making*" calico, it yet *is* a most important "improvement *in the manufacture of*" that article; and so in thousands of similar instances. Besides, even if "in making" and "in the manufacture of" *had* that synonymity which they have *not*, Mr. Baggs's assertion would be none the less untrue, inasmuch as he uses inverted commas so as to indicate that he is giving the exact title itself, and not some paraphrastic equivalent of it. The quoted sentence then proceeds to state that what is described in the specification of the patent referred to is not in accordance with the title of the patent. Let us see. The first sentence of the final specification recites that "*the object of my said invention is to diminish the very heavy expense which the manufacturer of chlorine has at present to incur for peroxide of manganese, and at the same time to enable him to obtain from a given quantity of hydrochloric acid a larger yield of chlorine than it has hitherto been practicable for him to obtain therefrom.*" A process and a combination of arrangements which enable the manufacturer of chlorine products to reduce his heaviest expense by from 80 to 90 per cent., and at the same time to double his production, surely constitute "Improvements in the Manufacture of Chlorine." Mr. Baggs may not consider them to be such, but that is only so much the worse for Mr. Baggs's judgment, which, like his veracity, as displayed in his letters on this subject, is conspicuous only by its utter absence. He goes on to repeat that the patent referred to "is not worth the paper it is printed on," because "the title is for making chlorine"—which I have shown that it is *not*—"while *the invention is for treating an oxide of manganese.*" The invention, however, as described in the particular specification in question, is only *partially* for "treating an oxide of manganese," or, rather, for a particular method of *producing* a useful oxide of manganese from the solution of chloride of that metal which is a residual product of the manufacture of chlorine. There are five "claims" included in that specification, and only one of the five (the second) is for this method of producing an artificial oxide of manganese, the first being for "the use in the manufacture of chlorine of an artificial sesqui-oxide of manganese, or of any practical equivalent thereof, or of any oxide or mixture of oxides inferior to sesqui-oxide, but yet capable of liberating chlorine from hydrochloric acid, *when such oxide, or mixture of oxides, is obtained, substantially by the method I have above described;*" the third being for "the general combination of operations by which I make the same manganese serve over and over again continually, and the combination of arrangements by which I am enabled to perform all the operations of my process in one vessel;" and the fourth and fifth being for certain methods of utilising certain bye-products of the process. If the invention defined by these five "claims" is not accurately described by the title, "Improvements in the Manufacture of Chlorine," no invention ever was, or ever can be, described accurately. Indeed, we may be quite sure that if there had really been any shadow of foundation for the assertion that the patent in question is invalid by reason of being wrongly intituled, even Mr. Baggs would scarcely have deemed it necessary to support that assertion by alleging that the patent has a title which it has *not*.

So collapses completely Mr. Baggs's last argument for the invalidity of my first chlorine patent—an argument based solely upon *falsehood:* upon a false statement as to the title of my patent, followed by a false statement as to what is described in its specification. One remark, however, which Mr. Baggs makes in the course of that argument I have yet to notice. It is that all the "known" oxides and mixtures of oxides of manganese which are capable of liberating chlorine from hydrochloric acid had been used for that purpose before I invented my process, and, therefore, that, although I was free to patent my new method of *producing* my oxide, I was not free to patent its use in the manufacture indicated. The oxide produced in my process, however, was *not* previously "known," and Mr. Baggs, at any rate, does not "know" it even yet. What I claim the use of in the manufacture of chlorine is of a certain oxide or mixture of oxides produced by a certain specified process, which process yields an oxide possessing properties which are not possessed by any artificial oxide of manganese ever obtained before. How little Mr. Baggs is aware of the properties of my oxide is evident from his contention, in his first letter to you on this subject, that my process could not work, on account of the impossibility of separating my artificial oxide from the solution in which it is formed. "Is Mr. Walter Weldon asleep?" he asked. "He talks of the subsidence of the oxide of manganese from the solution of chloride of calcium, and drawing off the latter solution preparatory to a fresh operation, as if it were the easiest and quickest thing to accomplish in the world. One would suppose he was speaking of the precipitation of some salt of lead, or silver, or mercury; it is so very easy, and so very soon done. Let anyone add an equivalent of lime to a solution of manganese, and he will understand the difficulty of separating the insoluble oxide from the associated liquor far better than any mere description can convey. *The former will not sink more than a trifling distance in the body of the liquid, even after a lapse of many hours; and any attempt to draw the latter off by a syphon, or otherwise, quickly causes the oxide to follow it in a state of intimate mixture. In fact, it is a bulky and intractable precipitate, and can by no means be dealt with in the off-hand manner which Mr. Weldon would have us suppose.*" What, however, is the experience with respect to these points of the manufacturers here and at Widnes who are actually practising the process in the largest chlorine stills in the world? Why, that the oxide, when formed from the strongest solution of chloride of manganese that can practically be made, will subside with extreme rapidity to from one-sixth to one-ninth of the bulk of the solution in which it was formed, and that the supernatant 6 or 8 ft. of clear liquor may then be drawn off from it, with the utmost ease, without the loss of an ounce of manganese. In the same letter Mr. Baggs evinced similar ignorance with respect to the *strength* of my oxide, and I verily believe that even now, despite his misleading quotation from Fownes, he could not even tell one what is its *colour*, were it to save his life.

I now come to the most pertinent part of Mr. Baggs's last communication, that *in which he himself admits that all his previous contentions in this matter have been absolutely false.* I had demonstrated them to be so; but now we have his own evidence to the same effect. After vehemently asseverating, not once or twice only, but over and over again, in the strongest language, emphasised by italic and capital letters, that at Ilford and Maidstone he had "practised on a large scale" that part of my invention above referred to which consists in the particular method by which I regenerate oxide of manganese from chlorine residues, he now confesses that he never did practise that process, either at those places or elsewhere, on any scale whatever. My process of regeneration consists essentially, as your readers are aware, in decomposing solution of chloride of manganese by means of lime or other similar agent, and then blowing air through the resulting mixture of protoxide of manganese with solution of chloride of other metal. Mr. Baggs's many times reiterated assertion that he had practised my process at Ilford and Maidstone was, therefore, a many times reiterated assertion that at those places he had decomposed still-liquor by means of lime or other alkaline base, and had then blown air through the resulting mixture, as aforesaid. We knew already that the facts were otherwise. We knew already that neither at Ilford nor at Maidstone had Mr. Baggs practically recovered oxide of manganese, as a *manufacturing operation, at all*, all that he had done there being to prove, by mere experiments with—to take his own statement of the quantities, the utter insignificance of which will be apparent when it is stated that a first-class manufacturer of bleaching-powder uses over 100 tons of oxide of manganese, and from 500 to 1000 tons of hydrochloric acid, per week—"some tons of lime and some tons of acid and manganese," that he was *unable* to recover oxide of manganese, on a manufacturing scale, at a price that would pay; and we knew already that the process which he did *not* "practise," but merely experimented with, at Ilford and Maidstone, was not only not *my* process, but, such as it was, was not invented by Mr. Baggs, but was the long-previously abandoned process which had been patented by Binks in 1839. Now, however, we have his own testimony to his own falsehood. "Although," he says, "*mostly using the dry process of recovery*"—that is to say, not *my* process, which is a *wet* one, but a process differing from mine as widely as any two processes for the accomplishment of the same end could possibly differ—"as deeming it, then and now, *better than the wet*, yet I have used"—again, not *my* process, but—"the wet process, *as produced*"—*not* by blowing air through a mixture of protoxide of manganese and solution of chloride of other metal, which constitutes the essence of my process, but—"*by the simple contact of atmospheric air upon the precipitated oxide by mere exposure.*" He thus distinctly states that the small quantities of oxide with which he experimented at Ilford and Maidstone, and which he has so many times declared were recovered by *my* process, and by no other, were "mostly" recovered—as we know they were *entirely*—by a process which differs from mine even more widely than the old process of converting iron into steel differs from the Bessemer process. He goes on to say that he has also used—not, be it observed, however, either at Ilford or at Maidstone, but at some place not yet named—what he calls, with an evident intention to mislead, "the wet process," but what he goes on to describe as consisting in "mere exposure" to "simple contact of atmospheric air upon the precipitated oxide," and therefore as being wholly different from the process patented by me. No such process as he thus speaks of can properly be called a "wet" process, as I could easily show if there were occasion; but as "the wet process" which Mr. Baggs thus professes to have used, in addition to the dry process which he now states that he "mostly" employed, is no longer alleged to have been the same as mine, but is expressly described as entirely differing from mine, I need not dwell on that point. Suffice it to have pointed out that Mr. Baggs has now himself confessed that his so often repeated allegation that he had practised my process before I had announced it to the world was the simple falsehood which I had already proved it to be. For offering, in proof of the falsehood of that allegation, not simple assertions, such as *he* deals in, but irrefragable facts, Mr. Baggs has showered upon Mr. Hook, Mr. Thomas, and myself choice flowers of rhetoric, culled from the foulest vocabulary that I have ever yet seen aired in print; but we have now, in addition to all the proof we had before, his own confession that all his previous claims and assertions with respect to this matter were simply *false*, from beginning to end.

There now arises another point, which concerns not only Mr. Baggs, but also the patent agent having the same address. Mr. Baggs commenced his unprovoked attack upon my process by alleging that it was a completely impracticable absurdity: the fact being that it was then already in successful manufacturing operation. Successively driven from position to position by proofs of the utter falsehood of all he had previously written, he who had begun by declaring that my process could not possibly be practised by anybody, next declared that he had practised it himself, and that, therefore, one of my patents for it is invalid; and then, after my having proved that he had *not* practised it, as alleged, he confesses that he had not, but asserts—how utterly falsely we have seen—that the patent in question is nevertheless void, by reason of a technical flaw. Now, if Mr. Baggs's claim to dispute the originality of my invention had had the least foundation in fact, as, however, I have proved, and he has now confessed, that it had not, he would have had an undoubted right to assert that claim in a public journal; if he could have shown, as I did in the case of his hydrochloric acid patent, that there was anything in my specification which had been previously published by someone else, he could legitimately have drawn attention to that circumstance; but he has no right, nor could he have under any circumstances whatever, to publish his mere opinion that my patent is technically unsound. The same remark applies equally to Mr. Vaughan, who, if Mr. Baggs's statement respecting him—that "he holds the confidence of many of the first men of the day"—be as true as all other statements made by Mr. Baggs in the course of this correspondence have been the reverse, will certainly, one would think, find it difficult to retain the asserted "confidence" after such action as he has taken in this matter. His "opinion" is no sounder than Mr. Baggs's, but its publication is none the less unjustifiable. He might just as well publish in a newspaper an "opinion" that there is a fatal flaw in the title deeds by which one holds some real property. All that I have written with respect to Mr. Baggs has been in sheer self-defence, in reply to a wholly unprovoked attack made by him, and simply to prove the falsehood of his statements, and to show what manner of man it was who made them; but the course which has been taken by Mr. Baggs can indicate only a deliberate endeavour to do me injury, at any cost, and Mr. Vaughan would seem to have elected to take a seat in the same galley. In the absence of any statement of the grounds of his "opinion," one cannot discuss them; but I remember his sending to one of the journals a similar "opinion" with respect to another patent (*not* of mine), which he thereby blew no more than a breath of summer wind shakes the pyramids, and we all know how given are a certain class of patent agents to endeavour to push their business by printing, wherever possible, vague talk about "the construction" of specifications. The "construction" of the specification of my first patent relating to chlorine has borne a keener scrutiny than Mr. Vaughan's, and I do not desire to be more certain about anything than I am that the validity of that patent cannot be impeached, on any grounds whatever, technical or otherwise.

Raven Hotel, St. Helen's. WALTER WELDON.

[As the discussion upon Mr. Weldon's patent was commenced by Mr. Baggs, the above letter from Mr. Weldon is inserted. In order that he may have the opportunity of replying to each of Mr. Baggs's statements; but since, from the tone the discussion has assumed, all public interest in it must have ceased, although the relative value of the respective claims appear to be as far from settlement as ever, we must decline the insertion of any further communications on the subject, unless in our advertising columns.]

PNEUMATIC RAILWAY TUBE.—A novel and economic tube, intended for use in constructing pneumatic railways, has been patented by Mr. A. BEACH, of New York, U.S.; it is composed of sheets of wood veneer, about one-tenth of an inch in thickness, laid one over another in alternate transverse spirals, and firmly glued together, forming a shell about one and one-eighth inch in thickness. This mode of laying up the tube secures strength and stiffness, and effectually counteracts the tendency of the wood to warp. The full sized tube is cylindrical in form, about 8 feet in diameter, and is put together in sections of about 5 ft. in length, with overlapping joints. The car is nearly cylindrical in form, running on wheels upon a track laid on the bottom of the tube. Around one end of the car is a disc, fitting as closely to the interior of the tube as it may without creating too much friction. The current of air pressing upon this impels the car. The impelling current in this case is created by a fan, shaped like an ordinary mar ine propellor, which is placed in one end of the tube, and driven by steam or any other power. Letter boxes are to be placed at convenient points along the line of the road—in a town they might be at every street corner—the boxes being divided into two compartments, marked for letters going in either direction. The boxes are so arranged that as the proper car passes the bottom of the box opens, and deposits its letters in a box of the car.

ARTIFICIAL MARBLE.—In a recent communication to the Paris Academy of Sciences Mr. Sorel described a new cement. It is obtained by slaking magnesia with a solution of chloride of magnesium in a more or less concentrated state. The denser the solution, the harder it becomes on drying. This magnesian cement is the whitest and hardest of all those known to this day, and can be moulded like plaster, in which case the cast acquires the hardness of marble. It will take any colour, and has been used by the inventor for mosaics, imitations of ivory, billiard balls, &c. The new cement possesses the agglutinative property in the highest degree, so that solid masses may be made with it at a very low cost, by mixing it up on a large scale with substances of little value. One part of magnesia may be incorporated with upwards of twenty parts of sand, limestone, and other inert substances, so as to form hard blocks; while the lime and other cements will hardly admit of the incorporation of two or three times their weight of extraneous matter. By means of these artificial blocks, building may be easily carried on in places where materials for the purpose are scarce. All that is required is simply to convey a quantity of magnesia and chloride of magnesium to the spot, if there be none to be had there, and then to mix them up with sand, pebbles, or any other matter of the kind close at hand; blocks can then be made of any shape, and imitating hewn stone. When the magnesia is extracted from the mother liquors of salt works the economy is enormous.

FIRE-DAMP AND SAFETY-LAMPS:

SOME REMARKS ON FIRE-DAMP AND SAFETY-LAMPS,

BY JOHN HUTCHINSON,

Manager of the Gas Works, Barnsley.

[Read at a meeting of the Geological and Polytechnic Society of the West Riding of Yorkshire, held in the board room of the Gas Company, Pontefract-road, Barnsley,—Mr. W. S. STANPHOPE in the chair.]

The subject upon which I am about to offer a few remarks is one of deep interest to colliery proprietors and the mining population generally; and I feel sure you will excuse me if I occupy a portion of your valuable time in relating some facts and observations recently made on this subject at the Oaks Colliery, and elsewhere. Anything relating to this ill-fated colliery is doubly interesting at the present time, since within the last few days some of the bodies of the volunteers who so nobly rushed into this fiery mine 10 months ago, in order, if possible, to aid, succour, or rescue their fellow-men from a dreadful and almost certain death, have at length, after overcoming many difficulties, been recovered, brought to the surface, identified, and interred, which is no small degree of satisfaction to their sorrowing relatives and friends. Those in the town of Barnsley who last Sunday and Monday witnessed the funeral processions, accompanied by the widows, orphans, and survivors of the Oaks explosion, as they passed slowly through the street, which were lined with spectators, will not readily forget the solemn impression then made: the sight of the numerous train of widows brought tears into many eyes. On the latter day the shops lining the principal thoroughfares were closed, and business suspended.

FIRE-DAMP.—Fire-damp, marsh gas, pit gas, or light carburetted hydrogen. Symbol, CH_2; sp. gr., ·552; 100 cubic inches weighs 17·12 grs. Specific gravity as compared with hydrogen is as 8 to 1. Fire-damp is a natural product, which issues from the ground, and admits of being kindled. It is a product of decomposition from beds of coal, and when it mingles with the air forms an explosive mixture. It is a colourless, invisible, inodorous gas, scarcely soluble in water: it does not support combustion or respiration. When breathed in a pure state it is fatal to animal life, but is not very noxious when mixed with air. Even when it forms 8 or 10 per cent. of the mixture the miners can work in it; however, when it is very strong it has been known to render them insensible, but the usual effects are a tightness across the forehead, with headache, which happens some time before insensibility takes place. Fire-damp alone does not burn or explode, for it must be mixed with air or oxygen before either of these phenomena can show itself. If mixed with too much air explosiveness is again lost. If the proportion of air be diminished to three or four times that of the fire-damp, or increased to more than 14 times its measure, explosion does not happen, for where the volume of air is very small an amount of oxygen sufficient to burn the fire-damp is not furnished; where the quantity of air is too large it prevents the spread of flame by conducting away heat, and preventing the temperature rising high enough to inflame the combustible gas. If mingled with twice its volume of oxygen, or ten times its volume of air, it detonates powerfully. When collected and consumed at the mouth of a gas-jar it burns away quietly with a yellowish-white light, somewhat similar to coal gas; but if the light is passed into the jar it is extinguished instantly. There is no immediately chemical test for the presence of this gas. A candle or oil lamp gives a white hea', which at once determines an explosion if introduced into an explosive atmosphere. Fire-damp being very light, little more than half as heavy as air, it ascends, collects, and lodges in hollows or recesses at the upper parts of the workings, and would, of its own gravity, readily escape at the surface into the open air, if there were a free course open for it to do so; so that while the lower part, or floor, may be ventilated and free from danger, a light brought near the roof might lead to a dangerous explosion. When an explosion does occur the life of the miner is likely to be sacrificed from several distinct causes, arising, first, from burning, as the very atmosphere in which he exists is instantly one sheet of flame, beyond the power of man to control, and from which he can seldom escape; secondly, by the mechanical violence of the sudden expansion of the gases on their ignition sweeping everything before it, or, the contrary, a comparatively and equally frightful rush of air to fill the partial vacuum caused by the contraction of volume of the exploded gases; thirdly, by being surrounded with, and thereby compelled to inhale, an atmosphere of carbonic acid and nitrogen. This often proves more fatal than any other cause, the entire system of ordinary ventilation being generally destroyed by the first blast, and the atmosphere passing with equal force on downcast and upcast, the deadly gases become, as it were, bottled up in the pit with an elastic cork. The gas left after an explosion is much lighter than black-damp, or even common air, and will make its way up to the roof, whilst black-damp will lie near the floor.

Fire-damp requires twice its volume of pure oxygen for complete combustion, the three volumes of mixed gases, after detonation, are condensed into one volume, they yield one volume of carbonic acid and two volumes of steam, which are immediately condensed. Now, carbonic acid contains its own bulk of oxygen, it, therefore, represents one of the two volumes of oxygen which disappear, whilst the other volume of oxygen has united with two volumes of hydrogen, and formed water. Light carburetted hydrogen must consequently contain twice its volume of hydrogen condensed with its own bulk of carbon vapour into the space of one volume. Thus, from the composition of fire-damp, it is obvious that the gas in exploding renders ten times its bulk of atmospheric air unfit for respiration; the two volumes of oxygen which ten volumes of air contain produce one volume of carbonic acid and two volumes of steam, which becomes condensed, leaving eight volumes of nitrogen at liberty.

Fire-damp from different localities has been frequently analysed, and exhibits a general uniformity in composition, consisting principally of light carburetted hydrogen, with varying quantities of carbonic acid, nitrogen, hydrogen, atmospheric air, and sometimes olifiant gas and sulphuretted hydrogen.

ANALYSIS OF FIRE-DAMP BY PROF. PLAYFAIR.

Light carburetted hydrogen	92·80
Nitrogen	6·90
Oxygen	·60
Carbonic acid	·30=100·60

THE SAFETY-LAMP.—The safety-lamp is a valuable instrument in the hands of a competent person, who thoroughly understands its use, for testing for the presence of fire-damp in coal mines; but the miner, actually at work, cannot be supposed to be at liberty to pay that nicety of attention to its indications that would appear desirable; but they ought to remember that the lamps should be gently handled, carefully attended to, and kept in the best possible order, and that they are not intended to be made a substitute for proper ventilation. Objections have been made by working colliers to some safety-lams for the small amount of light produced, and the inability to see their work fairly; and thus to make good wages induces the colliers, when either thoughtless, or otherwise satisfied that there is no fire-damp near, to unscrew the top of the lamps. Rules and regulations, backed up by fines, and now lately by liability to imprisonment, have been insufficient to stop this tendency, and to prevent the occurrence of numerous accidents which have resulted from it. Hence it is that much attention has been bestowed on the methods of locking the lamp to prevent the removal of the wire-gauze. It will be readily conceded that good rules and strictly enforced discipline among the workpeople are just as indispensable as a perfect lamp in the prevention of those accidents, often so cruel and so sweeping, which hurry away in one common fate the provident and innocent with the reckless and the guilty. In some safety-lamps, as the Clanny, Museler, and the Morrison, it may be said there is no temptation for the men to pick the lock, or to unscrew the top, because they have what they want—they have already plenty of light. But inasmuch as safety in a dangerous place ceases with the fracture of the glass, our colliery managers have generally been averse to their use in fiery mines. If a light producing a white heat, such as a lamp or candle, be used in the mine, no matter whether in the intake or upcast air-course, an explosion is liable to happen. If the gas ever becomes ignited, the flame will follow, so long as there is gas sufficient to support combustion, either with or against the current.

Much has been said and written upon the cause of colliery explosions, yet with the best known management they do occur. The very name of "Safety-Lamp" appears sufficient to satisfy all our scruples at once; it is relied upon with implicit confidence, and generally believed to be what its name implies. A safety-lamp is wanted; it is bought, sold, used, and believed to be such, no one taking the trouble to test whether it is or is not what it professes to be. If an explosion does, unfortunately, take place it is, indeed, rarely that its cause can be traced to its source satisfactorily; but the lamp is never once thought about. If the miner has his lamp in order he is said to be quite safe. Let us see if such is really the case. During the last four months I have, in conjunction with Mr. Wilson, the underviewer of the Darfield Main Colliery, and Mr. Mitton of the Mount Osborne, conducted a series of experiments upon the different kinds of safety-lamps in use, with a view to show their comparative merits, care being taken that each lamp of its kind was perfect, and in good working order. These experiments were witnessed by a number of gentlemen connected with the various collieries in the neighbourhood. A rectangular box, of deal boards, 12 ft. long, and measuring 11 in. by 4 in. inside, was inserted into a flue in connection with a chimney shaft, to produce a current. A current of air is sent through this box, the quantity and velocity of which was regulated by a small sliding door, which on being removed discloses an opening of sufficient size to admit a safety-lamp, which can be seen through a small square of glass fixed in the side. A service pipe of coal gas is connected by means of an India-rubber pipe, which is terminated by a small meter service, pipe, and tap, and the gas allowed to play into the end of the box. By the means of this pipe it will be seen that the current of pure air passing through can be diluted at pleasure, and the changes which the lamp undergoes can be easily seen through the square of glass in the side of the box. A Stephenson lamp was inserted, when the gas was turned on, and there was first a flickering of the flame, which had burnt steadily whilst the air was pure, and at one time appeared totally extinguished, only a tiny blue light, however, remained, wavering about within the gauze by which it was inclosed. The gauze in a short time got red-hot, and after the lapse of 1 minute 35 seconds the gas in the box exploded. The lamp was then removed, and was found to be still burning and uninjured; but generally the light was extinguished without exploding the mixture in the box. With the current of air passing through the box at the rate of five miles per hour—not an uncommon velocity in a pit—the following results were obtained, as ascertained by the anemometer:—The Davy exploded in 5 seconds; the Mousard in 6 seconds; the Clanny in 12 seconds; the Belgian in 13 seconds; and the Stephenson in 25 seconds. All these lamps were tested under the same circumstances. Some further experiments showed slight variations in the time, but all tended to two results. In the first place, it was shown that all the safety-lamps were really *unsafe* in a current of amospheric air and gas when mixed to on explosive point. And, secondly, that of the lamps now in use the Stephenson is the best and most reliable. In a *still* atmosphere of mixed air and gas all the above lamps were extinguished without igniting the surrounding atmosphere. It will be noticed that the foregoing experiments were made with ordinary coal gas.

An opportunity offering at the Oaks Colliery, it was thought desirable to

make similar experiments with the gas given off from the coal strata issuing from the pit. There were 1025 cubic feet given off per minute on Aug. 22 last, when the trials were made, with a velocity of 4½ miles per hour. The Davy lamp exploded in from 10 to 30 seconds; the Clanny in from 13 to 32 seconds; the improved Clanny was extinguished in from 5 to 160 seconds, and exploded in 30 seconds; the Belgium was extinguished in from 5 to 160 seconds, and exploded in 50 seconds; and the Stephenson extinguished in from 3 to 120 seconds, and once did not explode; and the "Cockney" was extinguished in from 3 to 18 seconds, and did exploded in 45 seconds. At this date the fire-damp contained 4 per cent. of carbonic acid, which would seriously affect its combustible properties, whilst the gas was free from other impurities. The following facts were ascertained:—That the fire-damp issuing through a 3/16th inch pipe would ignite at a piece of 3/8th inch iron wire heated to bright redness when held in a stream of gas. The same results were obtained with a ½-inch iron rod. With a bar of 1¼-inch square iron, treated in the smith's fire to bright redness, and carried through the air about 50 yards, occupying about 16 seconds in transit, it would ignite continuously the pit gas as as it issued from a bat's-wing burner for 1 minute 25 seconds. The same bar was then immediately applied to a bat's-wing burner with ordinary coal gas, which it continued to light for 1 minute 20 seconds longer, showing that the pit gas required a greater degree of heat to fire it than coal gas. It would likewise readily ignite at glowing charcoal, also at red-hot gauze, when played upon at a particular point for some seconds.

Thus I think we have succeeded in establishing the foregoing facts, and calling attention to them, which I trust will be of service to the miner, as well as to the scientific world. I am of opinion that a safety-lamp worthy of the name has yet to be invented. There are, certainly, no lack of labourers in the field, but the work yet remains to be done.

The benefit of the Stephenson lamp was fully shown a short time since at the Strafford Main Colliery, near Barnsley, where a large quantity of gas from some old breaks which had fallen was driven down the north side of the pit, extinguishing all the lamps in its course for a distance of 400 yards. A defective lamp or a naked light, there cannot be the slightest doubt, would have hurried into eternity the great body of the miners in the pit, although the colliery has the reputation of being very well ventilated, no expense being spared for that purpose by the proprietor. The above confirms, on a large and practical scale, the conclusions we had arat on a small scale—that hitherto the Stephenson lamp is the safe most to be relied upon under all circumstances, and that some of the so-called safety-lamps ought to be rejected as worthless, for there is an appearance of safety without the reality.

NEW PATENT DIRECT-ACTING STEAM-CRANE.

A very interesting and satisfactory trial of a novel combined steam and hydraulic steam-crane took place yesterday at the Duke's Dock, in presence of Mr. Mitchel, agent to the Bridgewater Trust, and many other gentlemen and engineers connected with steam-shipping. The crane is the patented invention of A. B. BROWN, C.E., of the firm of Brown, Wilson, and Co., Vauxhall Ironworks, London, by whom it was constructed. Before proceeding to the results of the trial, it may be as well to briefly give a description of the machine and the conditions under which it is designed to work. It seems a strange anomally that engineers and shipowners have been expending so much talent and energy in the endeavour to obtain high-speeded steam-vessels, while they have almost totally neglected anything like a comparative expecition in the charging and discharging of the vessel's cargo. Thousands of pounds have been spent on engines which would enable a vessel to save three or four hours in her passage, and after this has been accomplished she lies frequently as many days simply because she has not the same high-speed class of machinery to discharge her cargo. Anyone who has made a passage even in one of our most modern steamers will have been made painfully aware of the method of unloading steamers, especially should they get into port at one or two o'clock in the morning; his sleep will be continually disturbed by the rattle of small engines and inumerable cog-wheels, causing the ship to vibrate from stem to stern, her decks to leak, and her passengers' lives to be made miserable, not to mention the enormous tear and wear which the ship-owner must pay for.

The steam-crane tried yesterday seems to differ in many important points from any other generally used. Two large steam cylinders, 16 inches in diameter and 6 feet long, are placed upright on a turn-table or swivel platform, which is mounted on a carriage having four railways wheels. Between the two steam cylinders is placed a hydraulic cylinder, 7½ inches diameter. These three cylinders are fitted with pistons and rods, each terminating in one and the same top frame or cross-head, so that the motion of all three pistons are simultaneous and to the same extent. In this top frame three chain pulleys are arranged, having their grooves exactly vertical with three corresponding pulley wheels, working in a fixed frame on the bottom of the hydraulic cylinder. A chain is wound around these six pulleys begining at the top, and passing to and fro to the bottom until the whole six are occupied in the order of "block and tackle;" by this means, on the motion of the top frame, six plies of chain are distended, consequently one foot stroke on the pistons and frame will give 6 feet lift in the load, and so the steam cylinder having a height of stroke of 6 ft., a clear lift of 36 will be obtained at the point of the jib. Behind these steam cylinders are arranged the boiler and swing cylinder, and in front the jib, which projects some 16 ft. from the post, or centre, about which the crane revolves. The swing cylinder is 9 in. diameter and 3 ft. long; it is fitted with a piston having double rods, between which, and coincident with the centre of the cylinder, is clamped a chain, which passes without end around the post and over suitable pulleys in the turntable or platform of the crane. It is obvious if this platform moves around the post upon which the chain is wound, and if the latter be actuated from such platform, the chain will unwind itself form the post, causing the platform with jib to revolve in either direction according to which side the strain is applied. The boiler, which is placed immediately behind the swing cylinder, is of the upright description and is double rivetted throughout with welded flues, and it is worked at a pressure of 100 lbs. per square inch. The action of the crane is as follows: When the load is hooked on, steam is admitted under the large steam cylinder, when the "block and tackle" is distended and the load raised through the required distance at one stroke. The advantage of this is that the pistons of the steam cylinder move at one-sixth part the speed of the load, so that in fact the load may be made to fly up while the motion of the working parts are slow, easy, and without any noise. High pressure steam applied direct, however, frequently proves, like fire, a bad master, although a good servant; and it is with the latter view that the hydraulic cylinder is employed. For instance, should the chain break or the load slip from its slings, the steam pistons would fly away but for the governing action of the hydraulic cylinder, which contains a supply of water, to be expelled through a fixed orifice at both the upward and downward motion of the pistons and load. By this means the upward course of the pistons and load is perfectly controlled, while the descent of the load is regulated with the utmost nicety, by the quantity of water allowed to escape from under the hydraulic piston. In swinging round the crane steam is admitted to one end of the small cylinder according to the required direction in which it must move, and as this piston is applied directly to the post it follows that the ratio of its speed to that of the load will be as the circumference of the post to that described by the jib, or 1 to 36. In this cylinder, as also in the lifting cylinder, a very high rate of expansion of the steam is realised (1⅛ in.) steam sufficing to swing the crane completely round.

To further ensure economy in fuel the feed water is heated by the waste steam, and is forced into the boiler by a patent donkey pump, by the same maker.

Proceeding now to the trial: A flat containing 263 barrels of beer was placed underneath the crane, some 25 ft. below its level. These were raised, swung round one half revolution, and deposited in a warehouse, in a hour and a-half, the rate of lifting and swinging being in most cases two in one minute. In short, this, so far as the capabilities of the machine are concerned, could have been far exceeded, but for the difficulty in hooking on, and disposing of the goods delivered. As it is, the crane, we are informed, can raise 30 cwts. at a speed of 800 feet per minute, and it has, at the Hamburg Docks, where 16 have been at work, raised as many as 90 parcels of one ton each per hour, or 900 tons per day of ten hours, with a consumption of coal equal to 4 cwts.

The crane we have just endeavoured to describe is the first of its kind in Liverpool, and has been supplied to the Bridgewater Trust, the engineer and other officers of which express themselves as highly pleased with its performance.

We may mention, in conclusion, that the advantages claimed by the patentee are as follows:—The direct utilisation of the elastic force of steam governed by the inelasticity of water; the high working speed of load with low speed of machinery; the total absence of all cog wheels or revolving parts; lastly, extreme portability, combined with great power and speed, and without noise.

–Liverpool Daily Post.

CORNISH PUMPING ENGINES.—The number of pumping-engines reported for Sept. is 23. They have consumed 1816 tons of coal, and lifted 25 million tons of water 10 fms. high. The average duty of the whole is, therefore, 50,200,000 lbs., lifted 1 ft. high, by the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:—

Chiverton—Cookney's 60 in. ..... Millions	54·2
Cargoll Mines—Michell's 72 in.	58·1
Cook's Kitchen—60 in.	53·0
Great North Downs—Sleggan's 70 in.	52·8
Great Work—Loed's 60 in.	61·2
North Roskear—Doctor's 70 in.	53·9
West Caradon—Elliot's 50 in.	50·9
West Chiverton—Hawke's 80 in.	76·2
West Wheal Seton—Harvey's 85 in.	70·5
Wheal Seton—Tilly's 70 in.	64·6

A WONDERFUL DISCOVERY.—A gentleman who has been sojourning in the city for a few days claims to have in his possession the secret of a wonderful discovery for making subterranean explorations from the surface for mineral deposits by the application of electro-magnetism. The apparatus, as described, will indicate the direction of the bulk of a mineral vein at any depth, and affords a principle for calculating the species of the ore and the richness of the deposit. The discoverer claims his ability to distinguish with certainty the presence of either gold, silver, copper, or iron, by a momentary test of any location, and to determine at once whether a field is afforded for profitable mining operations. The direction of mineral deposits, when away from any railroad line, which exerts a counter attraction of great power, is indicated at a distance of several miles. It is intimated that the discoverer has refrained from making application for patents for his apparatus for fear of making a disclosure of his secret. It is also represented that the success of an American silver mining company, in the Lake Superior region, which has been remarkable, is attributed to the possession of this important discovery.—*Hamilton, C. W., Times.*

The manager of the ironworks at La Villette, one of the suburbs annexed to Paris a few years ago, but only subjected to the *octroi* since January last, has issued a notice, that in consequence of the heavy *octroi* duty on iron the establishment will be closed on Thursday, and that the workmen must seek employment elsewhere: 2000 men, it is said, are thus thrown out of work.

SALES OF COPPER ORES.

COPPER ORES SOLD AT THE CORNWALL TICKETINGS, FOR THE QUARTER ENDED SEPTEMBER, 1867.

Mines.	Tons.	Amount.
Devon Great Consols	5273	£24,289 6 6
Clifford Amalgamated	3356	15,682 5 0
South Caradon	1354	12,213 15 0
West Seton	1669	8,669 8 6
Marke Valley	1329	5,208 3 0
South Frances	573	4,131 3 0
East Caradon	809	3,302 12 6
Prosper United	1238	3,301 9 6
Wheal Seton	885	3,265 4 6
Wheal Rose	550	3,038 16 0
North Treskerby	541	2,700 11 0
East Carn Brea	623	2,534 4 6
Great North Downs	348	2,409 2 0
Prince of Wales	337	2,372 16 6
Phœnix	520	2,037 1 6
Wheal Friendship	388	1,928 11 0
West Basset	391	1,761 1 6
Craddock Moor	305	1,516 5 0
Crelake	360	1,502 17 0
Wheal Basset	247	1,436 5 6
South Crofty	372	1,395 1 0
Wheal Emma	274	1,324 14 0
East Rosewarne	225	1,286 13 0
West Tolgus	337	1,204 4 0
East Pool	399	1,177 12 6
Brookwood	270	1,176 6 0
West Caradon	231	1,132 1 6
Hingston Down	650	1,104 17 6
South Condurrow	118	1,102 15 0
West Damsel	218	964 12 6
Botallack	169	956 15 6
Bedford United	287	915 2 0
Copper Hill	191	852 8 6
Fowey Consols	176	769 7 0
Gunnislake	126	751 14 0
Carn Brea	180	748 6 6
Devon and Cornwall	280	734 3 6
Glasgow Caradon	229	732 19 6
East Russell	210	721 4 0
Bampfylde	63	719 15 6
Wheal Polmear	130	710 15 0
Carn Camborne	250	698 18 6
Wheal Margery	204	670 11 0
North Roskear	113	652 7 6
Par Consols	145	645 2 6
West Maria and Fortescue	242	580 16 0
North Grambler	90	542 2 6
Okel Tor	190	530 7 6
Rosewarne United	105	520 18 6
Levant	75	506 2 6
Fursdon	65	477 14 6
Nanglies	111	429 18 0
Gawton	138	402 3 0
Caradon Consols	77	331 14 6
East Grenville	92	325 1 6
Camborne Vean	93	291 17 6
Crenver and Abraham	85	270 2 6
Boscaswell	35	240 12 6
Cargoll	20	231 10 0
North Downs	41	215 5 0
Wheal Buller	58	199 9 0
New Treleigh	55	198 5 0
Wheal Crebor	59	188 16 0
Tolcarne	57	186 13 6
Wheal Polharmon	42	160 13 0
South Dolcoath	26	145 12 0
Emily Henrietta	32	135 4 0
St. Day United	29	121 1 6
Dolcoath	25	119 7 6
James's Ore	24	116 8 0
West Great Work	20	114 0 0
North Pool	18	113 17 0
North Crofty	25	113 2 6
East Basset	20	95 10 0
Wheal Curtis	42	92 8 0
South Basset	22	84 9 0
Hallenbeagle	26	75 8 0
Rosewarne Consols	17	74 16 0
Wheal Agar	19	72 13 6
Pendeen Consols	21	57 15 0
Tywarnhaile	20	55 3 0
Grambler and St. Aubyn	11	53 12 6
Mellanear	28	47 9 6
Collacombe	17	44 15 0
Wheal Grenville	16	44 0 0
South Tolgus	21	40 16 6
Richards's Ore	4	39 10 0
Maudlin	3	27 16 6
North Dolcoath	5	27 15 0
Huthnance's Ore	9	26 2 0
Tywarnhaile	9	21 12 0
Great Wheal Busy	12	16 16 0
Trevenen	2	14 14 0
Harmony	10	10 10 0
Michell's Ore	2	10 5 0
Wood	3	8 6 6
Old Pembroke	4	4 0 0

COMPANIES BY WHOM THE ORES WERE PURCHASED:—

Vivian and Sons	4985	£17,721 19 0
Freeman and Sons	1409	7,208 5 0
P. Grenfell and Sons	2620	16,811 17 6
Sims, Willyams, and Co.	3464	16,414 10 11
Williams, Foster, and Co.	4897	25,092 0 5
Mason and Elkington	3668	18,025 15 10
Bankart and Sons	1672	7,640 3 7
Copper Miners Company	2117	9,820 4 2
Charles Lambert	1882	8,357 10 5
Newton, Keates, and Co.	326	1,621 9 3
Sweetland, Tuttle, and Co.	1406	5,579 6 7
Hadland and Co.	230	961 1 0
Goole Alum Company	229	422 3 6
Landore Copper Company	346	828 1 3
Total	29,410	£137,216 19 0

COPPER ORES SOLD AT THE SWANSEA TICKETINGS FOR THE QUARTER ENDED SEPTEMBER, 1867.

Mines.	Tons.	Amount.
BRITISH.		
Knockmahon	2306	£16,749 0 6
Berehaven	1467	10,468 2 0
Irish	59	689 1 6
Ballycummisk	74	460 2 0
Belstone	27	381 7 6
Tigrony	18	324 18 0
Dyfngwm	23	186 17 6
Total	3974	£29,259 9 0
COLONIAL.		
Cape	1067	£20,692 14 6
Newfoundland	1473	12,048 6 6
Moonta	458	3,697 16 6
Gwalia	105	1,878 12 6
Yanganooka	139	1,857 18 0
Wallaroo	329	1,647 18 0
Matta	233	1,635 19 6
Concordia	73	936 7 6
Otea	22	275 16 0
African	8	182 8 0
Total	3907	£44,853 17 0
FOREIGN.		
Cuba	529	£ 6,657 1 0
Californian	293	3,404 11 0
Var	75	846 5 0
Victor Emanuel	14	129 10 0
Casali	9	83 0 6
Italian	13	43 10 0
Spanish	16	24 0 0
Total	949	£11,187 17 6
RECAPITULATION.		
British	3974	£29,259 9 0
Colonial	3907	44,853 17 0
Foreign	949	11,187 17 6
Sundries	51	732 5 0
Total	8881	£86,033 8 6

COMPANIES BY WHOM THE ORES WERE PURCHASED:—

Copper Miners Company	439	£ 3,835 4 0
Freeman and Co.	721	7,216 7 6
P. Grenfell and Sons	1377	14,675 0 0
Sims, Willyams, and Co.	634	9,363 3 9
Vivian and Sons	1795	13,114 7 6
Williams, Foster, and Co.	1622	16,886 17 0
Mason and Elkington	1067	10,959 5 3
Bankart and Sons	530	3,414 3 6
Charles Lambert	216	1,116 8 0
Sweetland, Tuttle, and Co.	310	2,201 3 6
Penclawdd Copper Company	71	1,311 15 6
Landore Copper Company	99	1,659 17 6
Total	8881	£86,033 8 6

FOREIGN MINING AND METALLURGY.

Refining pig sustains itself with some difficulty in the Moselle district at 2*l.* 12s. per ton at the works. The forgemasters have reduced their production to the extent of about 40 per cent., and they have about a sufficiency of orders to run off their thus diminished production. Rolled iron from charcoal-made pig is quoted in the Haute-Marne group at 8*l.* 16s. to 9*l.* per ton, with a scale of 4s. per class; mixed irons have brought 8*l.* 4s. to 8*l.* 12s., with a scale of 4s. per class; and coke-made, 7*l.* 4s. to 7*l.* 8s. per ton, with a scale of 8s. per class. A Foundries, Forges, and Steel Works Company has just been established at St. Etienne. The new concern proposes to manufacture steel rails, iron and steel tyres, axles, plates for ships, and cannon of various kinds, the managers hoping, no doubt, to turn a penny by the construction of engines of war in these piping times of (armed) peace. The Mokta-el-Hadid Magnetic Iron Minerals Company commenced the payment yesterday of interest on its shares for the first half of 1867, at the rate of 5 per cent. per annum. The concern known as the Chantiers et Ateliers de l'Ocean will pay, Nov. 2, half-yearly interest on its obligations, or 12s. per obligation. The Société Nouvelle des Forges et Chantiers de la Méditerranée commenced the payment yesterday (Friday) of a dividend on account for the exercise of 1867, or 1*l.* 4s. per share. The Andalusian Copper and Lead Mines and Foundries Company commenced the payment yesterday of a first division of 2*l.* per *action de jouissance*. Meetings are announced as follows:—Epinac Collieries and Railway Company, Nov. 11, at Paris; and Ahun Collieries Company, Nov. 13, at Paris.

Metallurgical industry is still passing through a severe crisis in Belgium. It is not that there is no demand for iron, locomotives, and trucks, but the railway companies have no more resources or credit; they wish to purchase, but they cannot pay for what they buy. Industrials, on their side, cannot accord long credits or immobilize a considerable capital in what are virtually loans. The situation has just been detailed with great frankness at a meeting of the shareholders of the Seraing Company. It was observed at this meeting—"Affairs have for some time been proposed on conditions of payment so at variance with old customs that the circulating capital at our disposal has become insufficient. The rails which we are making for Russia will only be paid for in January. A Belgian company has offered us contract for locomotives to be paid for in three years. Switzerland has put in adjudication for Lake Constance three ships of 32,000*l.* each, with payment after the delivery. Finally, we have abandoned an order for 80 locomotives for Russia, because it was necessary to make a *cautionnement* of 32,000*l.*, and to deliver these locomotives at Riga before receiving half their value; in other words, it would have been necessary to spend more than 120,000*l.* before receiving for the first half of the deliveries made." It is in such circumstances as these that the Cockerill Company, notwithstanding its present considerable floating capital and an undisputed banking credit, is about to issue a loan of 60,000*l.*, in order to increase its *fonds de circulation*. But what will become of industrials who cannot, like the Seraing Company, by a simple decision of the Council of Administration, increase their resources to the extent of 60,000*l.*, as, independently of the large capital which has to be sunk in land, buildings, machines, tools, and stores, a large further capital is required, in order to secure purchasers of the articles produced? The 80 locomotives which the Cockerill Works have refused have been accepted by the Creusot Company, at 86*l.* per ton. This is a considerable order lost to Belgium, and it is to be feared that other orders will be lost to Belgian industry if large capitals are to carry the day. The Syndicate of Belgian forgemasters, formed some time since, has rendered great services to Belgian metallurgy, and the constitution is now proposed of a Union du Credit des Forges, which also seems based on a good idea. In connection with the supply of 960 wheels to be furnished to the Belgian State Railways, it is remarked that wheels with tyres of cast-steel were let at 6*l.* 3s. 4d. each; last year the same price was paid for wheels with iron tyres as is now to be paid for wheels with steel tyres. The representative of a Sheffield house is understood to have secured a contract for some of these wheels. The Neue-Oege Mines and Ironworks Company will pay, Jan. 2, 1868, a dividend of 10 thalers per share. The Silesian Mines and Ironworks Company will pay, Nov. 15, the second half of the dividend for 1866. The Hoerde Mines and Ironworks Company will pay, Jan. 2, 1868, a dividend for the exercise of 1867-8, at the rate of 9 per cent. Meetings are announced as follows:—Belgian Company for the Construction of Machines and Railway Plant, Oct. 31, at Brussels; Bois Colliery Company, Oct. 31, at Quaregnon; Sars-Longchamps and Bouvy Collieries Company, Oct. 31, at St. Vaast; Frederick William Mines and Ironworks Company, Oct. 31, at Mulheim-sur-Ruhr; South of Charleroi Blast Furnaces and Ironworks Company, Nov. 5, at Marcinelle; and Châtelineau Blast Furnaces, Ironworks, and Collieries Company, Nov. 14, at Brussels.

The coal basin of the Pas-de-Calais has become one of the modern industrial marvels of France. Unknown in 1850, its extraction has acquired during the last 17 years a very great development and importance. Even during the last six years the progress made has been very rapid, for while in 1861 the extraction scarcely exceeded 9,000,000 hectolitres the estimates for 1867 show a total of 20,000,000 hectolitres, or more than double. The number of concessions granted for the working of the basin is 20, these concessions extending over a total superficies of 540 acres; there are 41 pits in working out of 45 sunk. The total production in 1866 was 18,061,638 hectolitres, as compared with 15,548,350 hectolitres in 1865, showing an increase last year of 2,513,308 hectolitres. The production of the two years was divided as follows:—

Working.	1865.	1866.	Increase.	Decrease.
Dourges ....Hectolitres	1,114,784	1,275,151	160,367	—
Courrières	2,254,937	2,580,669	325,732	—
Lens	2,839,709	3,939,190	999,481	—
Bully-Grenay	2,005,205	1,927,324	—	77,881
Nœux	1,856,029	2,145,314	289,285	—
Bruay	959,486	993,550	34,064	—
Marles	713,404	967,811	254,407	—
Ferfay	682,062	877,824	195,762	—
Auchy-au-Bois	356,528	449,188	92,660	—
Flechinelle	95,008	53,105	—	41,903
Vendin	330,180	297,084	—	33,096
Meurchin	709,987	746,821	26,834	—
Carvin	702,788	797,717	94,929	—
Ostricourt	254,470	152,386	—	102,084
Lievin-Aix	267,686	328,750	59,064	—
Douvrin	56,891	248,164	191,273	—
Cauchy-à-la Tour	214,428	204,856	—	9,572
Hardinghem	22,748	76,734	—	53,986
Total	15,548,350	18,061,638	2,513,308	—

The revival in affairs in Belgium during part of last year made 1866 an extraordinary year as regards the sale, but the situation has since become one of a more ordinary character, to the great benefit of manufacturing and agricultural industry.

Copper has displayed a certain feebleness of late on the principal continental markets. At Rotterdam, English has made 50 fls. to 52 fls. At Havre, Chilian in bars has been quoted at 71*l.* 10s. to 72*l.*; Peruvian mineral (pure standard), 76*l.*; United States (Baltimore), 80*l.* to 82*l.*; ditto (Lake Superior), 80*l.* to 97*l.*; Mexican and Plata in bars, 70*l.* to 72*l.*; Russian, 88*l.* to 90*l.*; old yellow copper, 44*l.* to 52*l.*; red ditto, 68*l.* to 69*l.*; bronze ditto, 66*l.* to 68*l.* per ton. At Marseilles, Toka for consumption has brought 74*l.*; Spanish, 72*l.*; refined Chilian and Peruvian, 80*l.*; old yellow copper, 64*l.*; rolled red copper for sheathing, 88*l.*; yellow copper, 80*l.* per ton. At Paris, English in plates has realised 78*l.*; Lake Superior, 88*l.*; Chilian, 72*l.*; and Corocoro mineral, 75*l.* Some indications of improvement are reported from Holland as regards Banca tin; in Germany, however, quotations have given way slightly under the influence of the fall reported a week or two since in the Dutch markets. At Rotterdam, Banca has brought 53¾ fls.; and Billiton, 52¼ fls. to 52¾ fls. At Amsterdam, Banca has been quoted at 53½ fls. to 53¾ fls. At Paris, Banca has made 96*l.*; Straits, 94*l.*; and English, 93*l.* per ton. At Havre, Banca has been quoted 88*l.* to 90*l.*; Straits, 86*l.* to 88*l.*; and Peruvian, 85*l.* per ton. At Marseilles, Banca has made 96*l.*, and English in sheets 98*l.* per ton. Although there have been no very important transactions in lead, prices have been generally sustained, and have even displayed an upward tendency on the German markets. At Rotterdam, Stolberg and German have made 11¼ fls.; and at Amsterdam soft lead has brought 11¼ fls. At Paris, Spanish saumons have realised 19*l.* 12s.; French ditto, 19*l.* 12s.; English, 19*l.* 12s. to 19*l.* 16s.; and German, 20*l.* At Havre, Spanish has been quoted 19*l.* 6s. to 19*l.* 8s.; and lead from other sources, 19*l.* 6s. to 19*l.* 10s. At Marseilles lead in saumons, first fusion, has made 18*l.* 8s. to 18*l.* 10s.: ditto, second fusion, 18*l.* 4s.; lead in shot, 19*l.* 16s.; and rolled and in pipes, 21*l.* per ton. The tone of the zinc markets displays little variation; at Hamburg and Breslau affairs have been quiet, but prices have been sustained. At Paris rough Silesian has made 22*l.*, and lead from other sources 21*l.* 12s. per ton. At Havre lead has brought 20*l.* 8s. to 21*l.* per ton. At Marseilles zinc in plates re-cast has realised 18*l.* 4s. and rolled 28*l.* per ton.

THE MINERAL RESOURCES OF CANADA.—A lecture on this subject was delivered at the Ottawa Natural History Society, by Dr. Otway. On the platform were Mr. Billings, the eminent palæontologist, Dr. Van Cortlandt, Mr. Thorburn, Mr. T. D. Phillips, Dr. Jones, &c., The lecturer said he had come from a distance of 1500 miles, being induced to do so by hearing so much of the mineral resources of the country. The accounts which had reached him were extraordinary, and yet he had been disappointed, for he had found it much richer than even the representations he heard had led him to believe. He had explored the mineral regions of northern and southern countries all over the world, Siberia, Russia, Java, Sumatra, South America, Australia, &c., but he had never seen a country that could compare with Canada in metalliferous ores. Here were to be found auriferous and argentiferous ores, plumbago, and others in great profusion, but capital was needed to develope it, and bring it to market. He had no hesitation in saying that the mineral wealth of Canada was sufficient to make it the greatest and richest of England's dependencies. Here the lecturer went into some animadversions on the maladministration of the Government in reference to the public lands in general and the mineral lands in particular. A specimen of plumbago, taken from the land of Mr. Pennock, which the lecturer declared to be a magnificent one, was exhibited. He also spoke of the Burt claim in high terms. After treating the audience to some philosophical speculations as to the formation of metalliferous deposits by the agency of electricity, he gave a brief account of the Madoc gold mines, where he said gold, silver, nickel, plumbago, and other metals abounded, and that the works in that region would pay heavily if capital were brought to bear as it should be. The Tudor ores were described as being comparatively rich in silver. The lecturer said much of the capital used in the mines that had been opened came from the United States, and already swindlers were in the business. Adventurers would take a few grains of gold from surface, exhibit them, publish a book giving the mines fine names, and sell stock which was worthless. He advocated the establishment of a school of mines by the Government, and after some other remarks he concluded with the announcement that this was the preface to a future lecture. Mr. Billings was called upon for his opinion as to Dr. Otway's assertion that coal would be found in Canada. He contented himself with observing that if coal were ever found here it would prove the overthrow of the present geological theories. Dr. Van Cortlandt and Dr. Grant each made a few remarks to the same effect, and the audience separated.—*Ottawa Times.*

Meetings of Public Companies.

THE NEW QUEBRADA COMPANY.

The second annual general meeting of shareholders was held at the London Tavern, on Thursday,—Mr. STOCK, M.P., in the chair.

Mr. J. WRIGHT, C.E. (managing director), read the notice convening the meeting. The report of the directors stated—

Since your last meeting, when the shareholders were informed that a contract had been entered into for the construction of the railway, the contractors, with their staff, have landed in Venezuela, and for the last four months have been engaged in pushing forward the railway works. The preparatory operations necessarily occupied some time; nevertheless, considerable progress has been made, and in the report received last mail the resident manager says—"I rode on the locomotive from Agualinda to Tucacas, over 11½ miles, bringing down two heavy loads of mahogany with perfect safety and comfort." A preliminary survey from from Agualinda River to Palma Sola has been made, and as soon as the bridge is thrown over the river (and a large portion of the timber is now ready) the way will speedily be laid on to that point, the contractors having found, as they inform the directors, a short easy line, offering no engineering difficulties. Palma Sola reached, your board has every reason to believe that a very considerable traffic in the produce of the country will be attracted towards your line, and be shipped at your port at Tucacas. The mines are now being worked in a systematic method, upon maturely considered plans; it is requisite that they should be opened up in a scientific manner, in order that by the time of the completion of the railway they may be in a position to furnish a regular and adequate supply of ore. A survey and exploration of a portion of your property, generally believed to possess rich deposits of both gold and silver, is now being made, and your board expects by the next mail to have a report upon this subject.—Timber and Vegetable Products: The attention of your board has been directed to the question of working the timber and other vegetable products, and ascertaining the best markets for them. A cargo of mahogany, cedar, rosewood, ebony, fustic, and mangrove bark is now ready, and will be dispatched home by the first available ship, so that a commencement will be made. The arrangement as to the title and conveyance to the company of the freehold of the lands and mines in Venezuela, referred to in their last report, has been since duly confirmed by the order of the Court of Chancery, and thereby, also, all matters of account, or in dispute and litigation, between Messrs. Bird and Frederick Shand Hemming and the old and new companies, were disposed of, and finally settled. The deeds directed to be executed by the order, now that vacation is ended, will be at once completed. The board has every reason to feel satisfied with the present aspect of the affairs of the company, and they hope by the next half-yearly meeting of shareholders that the railway will be completed to Palma Sola, and other matters equally advanced.

Mr. W. SALMON stated that he begged to propose that the report of the directors and the balance-sheet be received and adopted. He moved that preposition with the view of being in order, but, before any observations were made upon the business of the meeting, he wished to point out that the directors stood there more or less arraigned upon a most serious bill of indictment, preferred against them by their old friend, Mr. Consul Hemming. And as they had been so charged, the Chairman and himself had decided that the shareholders should have an opportunity to-day of considering whether or not they were worthy of their confidence. It was a matter of regret, though not of surprise, that the pamphlet of Mr. Consul Hemming had made its appearance. At the last half-yearly general meeting, Mr. Consul Hemming complained of the circular issued by Mr. Wright, in answer to one issued by himself; and one of the statements Mr. Hemming made at that meeting was, that he regretted that he had not time to put into print what he had intended to allude to, but that he would do so in due time. And when the pamphlet did appear, which was only a few days since, and he found there was an attack not only upon the Chairman but also upon himself, he at once proposed to his colleagues that the Chairman and himself should be the outgoing directors. It was a matter of considerable regret to him that the Consul, who had been delegated as the representative of the country in which they were carrying on this large work, should consider it his duty and interest to frustrate and throw difficulties in their way, for the successful completion of such a work must redound to the credit of the country, and at the same time they hopeu would bring large profits to them as shareholders. (Hear, hear.) But as Mr. Consul Hemming had (in his pamphlet, at page 42) "defied his most unscrupulous detractors to convict him of falsehood," if he (Mr. Salmon) did not do so he should consider he had no answer to the charge; but he pledged himself to convict Mr. Hemming of falsehood, and upon his own documents. The first 18 pages of the pamphlet were taken up in describing what at the last meeting the shareholders did not think it worth their while to hear, referring to the testimonial presented to him. He (Mr. Salmon) belonged to a profession which only expected to hear evidence of character when that character was, attacked. He (Mr. Salmon) had never made any charge whatever against Mr. Consul Hemming, and for aught that he knew he was a perfect gentleman, although he could hardly say that the longer one knew him the better one liked him. Some 10 or 12 pages of the pamphlet were occupied about the immortal Boydell engine, and three or four pages were devoted to personal abuse, and in terms that, for Mr. Consul Hemming's sake, had better have been unused. As he (Mr. Salmon) had said the gauntlet had been thrown by Mr. Consul Hemming, and, therefore, he was bound to accept the challenge. At page 24, Mr. Consul Hemming quotes a conversation that was had with himself (Mr. Salmon) upon a most material question affecting the interests of the company. It was whether they should introduce Boydell's engine, and at that meeting Mr. Crosskell was present. Mr. Consul Hemming knew that his (Mr. Salmon's) impression with regard to Boydell was not a favourable one, and he suggested that Mr. Crosskill—a gentleman of great influence and honesty—should give his opinion upon the subject. Mr. Consul Hemming went on to say that he (Mr. Salmon) cross-examined Mr. Crossgill in such an offensive way, that he declined to answer any further questions. Now, there was not a scintilla of truth in that statement. The only question he put to Mr. Crosskill was—Do you believe Boydell's engines will answer our purposes? The answer Mr. Crosskill gave was—I cannot say they will. The Consul said Mr. Crosskill did not say they would not, but it was enough for his (Mr. Salmon's) purpose, and sufficient to his judgement, to known that Mr. Crosskill could not say that they would answer. (Hear, hear.) He then quoted extracts from Mr. Hemmings's own letter, in refutation of his allegation that he (Mr. Salmon) had pledged himself to support Mr. Hemming being appointed manager of the company, and proceeded to state that, at page 26, Mr. Hemming had made a most material misstatement. Speaking of the debentures, Mr. Hemming says—"They (the directors) have already succeeded in making use of that power to the extent of 40,000*l.* in debentures, at the onerous interest of 10 per cent." Now, gentlemen, what was the fact? Why, that up to this time not a single one of those debentures had been issued. (Hear, hear.) Even those due to the contractors amounting to only 1100*l.*, even those were not yet actually issued. The fact was, the directors could not issue the 40,000*l.* of debentures without the sanction of the shareholders. Again, at page 29, Mr. Hemming made a statement which was a positive untruth, with regard to the appointment of directors. Mr. Hemming says—"I urged it also upon Mr. Salmon, who from some unaccountable coyness, coquetted with the situation, perhaps from doubt as to whether we should succeed, and, therefore, wished to wait to see the result before he committed himself. Now, those who were shareholders could not fail to recollect that he (Mr. Salmon) refused over and over again to be a member of the committee. Mr. Hemming urged upon him again and again to become a member, and he wrote a letter declining to serve, and received another in return from Mr. Wright, to the effect that unless he did serve the committee would be knocked up, and, therefore, to prevent such a contingency he accepted the position, and the same argument also applied with regard to the direction. As to the Articles of Association, Mr. Hemming had made a statement which was also untrue, and, were it true, would render the directors unfit to occupy their position. Suffice it to say, not one single word of that statement was true, and was nothing but a malicious myth from beginning to end. The Articles were delayed, and necessarily delayed, by counsel, by the solicitor, and by the directors, and simply because there were many difficulties to settle. But who did the shareholders think received the first copy of the Articles when they were ready? Why, Mr. Consul Hemming. (Hear, hear.) Shareholders would recollect that Mr. Hemming had told them upon a previous occasion that in advocating the introduction of Boydell's engine he had no interest to serve. As he (Mr. Salmon) had promised to convict Mr. Hemming upon his own evidence, he would quote his own words, from his own pamphlet. At page 33 Mr. Hemming says:—"At the first public meeting I felt that some suggestion might be made, and I, therefore, anticipated it by publicly offering that whatever benefit accrued to me from the sale of the engines and endless railway I would make a present of to the company, and I have invariably offered the same to successive directors and managers." At the last meeting Mr. Hemming told them he had no interest in the Boydell engine, and had nothing to do with it. (Cries of "Oh, oh!") If evidence had been wanting, the facts he had just mentioned showed that, if the board of directors had appointed Mr. Hemming as manager, they most certainly would have placed him in a very wrong position. (Hear, hear). Mr. Hemming had not informed the shareholders that he had got rid of his shares; for at the date of the last meeting he held something like 2 0, having bought 45 shares before it took place; but, upon the flood of the market, he sold his shares, as he now held but five. His pamphlet must have cost him 20*l.*, and he held an interest in the company to the value of something like 5*l.* Could any shareholder tell him (Mr. Salmon) why Mr. Hemming should spend 20*l.* to damage their property? Was it to protect his five shares, or was it for some malicious motive? He had been told that that Mr. Hemming had stated that he had made him (Mr. Salmon) a director, and that he would unmake him. It was certainly true Mr. Hemming had taken a great deal of trouble to make him a director, and he was flattering himself when he said he would have more trouble to unmake him. (Hear, hear.) As to the proposition that the Consul once made to him about giving 600 *l.* to his nephew, at the time Mr. Salmon thought it was a serious proposition; but what was the result? Why, they had since arranged to pay 250*l.* instead of 6000*l.*, and they had secured the freehold of the mines, instead of merely holding the lease, which would be of the most invaluable service to the company. (Hear, hear.) Mr. Hemming had also introduced a malicious feeling into the pamphlet, with reference to the legal dispute with Mr. Pittar. Was it to try to benefit the company that Mr. Hemming had stated that there were large and serious claims hanging over the heads of the shareholders, when such was not the case? Mr. Hemming had also introduced the matter of Mr. Pontifex holding 200 shares, which were worth about some 200*l.* The fact was at that time company law was as uncertain as what to-morrow's weather would be, and, therefore, it was a very difficult thing to know what to do with Mr. Pontifex's shares. The directors had either to forfeit his shares or some of his proper y. The only object the directors could have was to do that which was most liberal to him, and at the same time just to the shareholders. Before the enquiry took place his name was removed from the register. He (Mr. Salmon) neither complained of Mr. Pontifex nor of the Vice-Chancellor. Mr. Pontifex had incurred certain costs, and he was entitled to be paid, and he got his order for the costs. He (Mr. Salmon) had thought it right, as an outgoing director, to refer to these different facts before the business of the meeting was entered upon. He placed his seat at the disposal of the meeting, to re-elect him or not, as they chose. (Hear, hear.)

The CHAIRMAN said it was his duty to second the proposition for the adoption of the report, because Mr. Salmon, in order to make his statement, had proposed the resolution. In the first place he had to state, in reply to Mr. Hemming's bold assertion that his (the Chairman's) qualification was not his own property, that it was a most deliberate falsehood. The shares he held he bought and paid for with his own money, and nobody in the world had the smallest claim upon them. It was, moreover, asserted that he was indebted to the company to a small amount. This was mentioned at the last meeting, and all he had now to state was that as soon as the figures were ascertained in connection with the account between his firm and the company he received a cheque from the company, and he gave a cheque for the amount due to the company. He (the Chairman) thought the animus that had dictated such an assertion was sufficiently evident. (Hear, hear.) Upon previous occasions it had been his duty to address the shareholders with feelings of anxiety, and at the same time overwhelmed with a sense of responsibility which rested upon him. That anxiety was not occasioned by any doubt as to the value of the property which had been entrusted to their administration, but arose solely from the consciousness of the difficulties they had to encounter—difficulties to which they were more keenly alive than the shareholders could possibly be. But upon the present occasion he spoke with far greater confidence than ever before, not that they had overcome all those difficulties, but because they were actually making progress towards the attainment of the objects they had in view. (Hear, hear.) At the last meeting he detailed the basis of the contract entered into for the completion of the railway, and in pursuance of that contract the work had been making progress in a satisfactory manner. Immediately everything was settled the contractors, with their staff, went to Venezuela and organised their operations, and the result was that the railway to Agualanda was completed, and they were now making progress with the bridge over that river; in fact, to quote the words of their resident manager—"I rode on the locomotive from Agualinda to Tucacas, over 11½ miles, bringing down two heavy loads of mahogany with perfect safety and comfort."

Now, that work was in full operation, and with as much speed as was compatible with safety; and when the board had the honour of again meeting the shareholders he hoped to be able to give such a report as would be perfectly satisfactory. (Hear, hear.) There was every prospect that the line would be completed to Palma Sola by June next. An option was reserved for the company to cease the construction of the railway at that point if it should be desirable to do so: and they had up to March 30 to determine whether they would exercise that option or not. The directors proposed some time before that date to call the shareholders together, to lay the whole of the circumstances before them, and leave them to decide the question. He might mention that they had been very fortunate in securing the services of an American engineer, through whose skill and energy a shorter and easier route had been found between Agualinda and Palma Sola; and when the latter point was reached they might expect considerable traffic to be carried over their lines of railway, the country between Palma Sola and San Filipe being richly cultivated and of a fertile character. As to the mines, the ore had been rather quarried out than worked according to the scientific principles of mining adopted in the present day, and in order that everything might be ready whenever they were in a condition to bring the ore down, they had sent out a mining captain and staff especially to open up the mines in a manner requisite and desirable. As stated in the report, they had not received any statement from the exploring party as to the existence of gold and silver mines, but they knew from Humboldt that one of the great sources of the riches of the Spaniards was found in the bed of the valley of Aroa. As to the timber, he had to state that the cargo that had been got ready was not coming home, and for the simple reason that it had been sold over there. Mr. Mathews writes with regard to the vegetable products of the property as follows:—

"We are progressing favourably with this, and have sold about 30 tons of fustic, at a profit of 20 per cent. To-day I have been with Messrs. Boulton and Co., and have, I believe, succeeded in arranging a large business, that will leave nearer 30 per cent.; also with Messrs. Polly and Co. we are arranging a business in other woods, which will also leave 30 per cent. On the wharf at Tucacas we have about 100 tons of excellent mahogany, this, as vessels are so difficult to get, I shall also try and sell here. Next month I have a chance of disposing of this to advantage. With regard to shipment by vessels from here, it is very rarely that we can get a freight, and I do not think any captain would come to Tucacas, so that we always have the expenses to Puerto to pay. I think it would be better to work the trade on this side for (say) six months, always keeping a stock on hand ready for shipment, in case a vessel is procured at any time, and then you would see whether the business pays or not. I believe we can make a clear profit of about 25 per cent. on a few thousand pounds."

That was an important statement, but as they had not received any account of the sales they could not guarantee the figures. Although Mr. Mathews might be a little over-sanguine, his statement was confirmed by Mr. Mullings, who reports that the sales had been effected at a very considerable profit. (Hear, hear.) It was not the intention of the directors to go fully into that matter until they had more funds at their disposal, although, no doubt, large profits would be realised. It was proposed to employ a commercial botanist to report upon the value and resources of the various vegetable products of the country. It would be also very desirable to immediately promote a system of emigration amongst the German families; but that would incur an outlay of capital that they were hardly justified in making at present. He concluded by stating that, like his friend, Mr. Salmon, he had placed his resignation in the hands of the shareholders, and, whatever their decision might be, he should always regard it as a very high honour that he was selected by such a distinguished body as constituted the board to preside at their deliberations. He believed the company had before it a great and prosperous future, and he hoped and trusted he should always continue a shareholder, to participate in the results. (Hear, hear.)

Mr. LEWIN was surprised that the shareholders tolerated such attacks as that made by Mr. Hemming. The fact was he was a perfect nuisance. Why did he not sell his five shares at the same time he sold his others? He (Mr. Weguelin) was a large shareholder, and it was abominable to see his property damaged by this man. (Hear, hear.)

Mr. Consul HEMMING made several attempts to address the meeting upon the questions raised in his pamphlet, but they declined to hear him.

After some discussion, during which several questions were satisfactorily replied to by the Chairman, the motion for adopting the report and balance-sheet was received and adopted.

Upon the proposition of **Mr. LATHOM BROWNE** (the late Chairman), Messrs. Stock, M.P., and W. Salmon were re-elected directors, there being but one dissentient—Mr. Hemming.

Mr. BURRIDGE proposed a resolution condemnatory of the course that was being pursued by Mr. Hemming.—**Mr. BROWNE** urged upon the meeting not to pass the resolution. No man had been more annoyed by Mr. Hemming than he (Mr. Browne), but still he should not like his position jeopardised by such a resolution being put on record.—The proposition was duly seconded, but it was considered the terms used in the resolution were somewhat too strong to be placed upon record; and, therefore, it was withdrawn.

Upon the proposition of Colonel **STRANGE**, it was resolved—"That considering the very great labour and ability bestowed by Mr. Wright upon the reconstruction of the company, and upon the negociations for the contract with Messrs. Carr, Simmons, and Co., and the details connected therewith, it shall be proposed at the next general meeting of shareholders that a sum of 250 guineas be voted to him as remuneration for his extra exertions in the matter, and the board comes to this resolution believing that it will be more satisfactory to Mr. Wright that such testimony should be borne to the efficiency of his services by the general body of shareholders than to receive a vote of the sum which the board recommends from the directors only."

A cordial vote of thanks was passed to the Chairman, directors, and managers, which terminated the proceedings.

OTEA COPPER MINING COMPANY.

An extraordinary general meeting of shareholders was held at the company's offices, Austinfriars, on Wednesday,

Mr. PHILIP WRIGHT in the chair.

Mr. J. H. MURCHISON (the secretary) having read the notice convening the meeting,

The CHAIRMAN said it would be remembered by the shareholders that at the meeting held in July last the directors were empowered to invite the subscription of 10,000*l.* by the shareholders, that sum being considered by the directors necessary to pay the liabilities and carry out the works. Of that amount they had only received promises of 3245*l.*, which sum included 2000*l.* by the Great Barrier Company. The directors, after full consideration, had come to the conclusion that the best course was to wind-up, in pursuance with the notice convening the present meeting, more especially as they found that shareholders would not subscribe more than their respective proportions of the capital necessary to carry on the works for those who held back, and who, when the mines became profitable, would reap the benefit of that outlay. The directors had fully considered the matter, and thought that the only course was a voluntary winding-up, as several of the creditors were very pressing This step was the more unpleasant, as from the advices received on Tuesday, from which he (the Chairman) would read extracts, as well as the report of Captain Rowe, the mines never looked better:—

Mr. Allom wrote from Auckland, Sept. 2.—"The operations of the tributers during the three months which would expire on Aug. 27 have been, on the whole, satisfactory. During that period twelve men and a few boys have broken and dressed about 70 tons of ore, and it is a remarkable circumstance that the crushing machinery has not been used during that period more than on an average once in ten days, with a consumption of fuel of about 40 tons for the three months. Under Capt. Higgins's management this quantity of firewood would not have lasted more than two weeks. I have agreed with the tributers to let the works again on the same terms for a further period of three months, which will expire on Nov. 30 next. As yet there has been no shipment of ore since the departure of the Mary Shepherd. I imagine we shall ship all we have in the Ida Zeigler, which ship has not yet arrived. Mr. Nathan will, I have no doubt, continue to advance on it at the rate of 7*l.* per ton. The tributers contemplate increasing their operations by the employment of more men. Though I regret the unfortunate results to the company from the appointment of Capt. Higgins, I observe with much satisfaction the expression of the directors' concurrence in my views with reference to the termination of his engagement, and shall act accordingly. He is very desirous of being released at once, but financial considerations, of course, preclude me from making any arrangement with him. In the meantime his services and those of his son are made available in exploring the new lode, now called the upper lode, and in making other researches, the result of which is a further discovery of ore cropping out in a gully, situated between what was called the new lode and the old mine, at about equal distances from each other. I have prepared two boxes of specimens, which I hope to forward to you by the Ironside, which will leave in course of a few days. I should mention that for the present the latest discovery had been named by me the middle lode. Other discoveries will, doubtless, shortly be made, which will necessitate some other mode of designating them. Capt. Higgins has instructions to explore two other gullies between the middle lode and the mine, and I feel pretty sure he will find other outcrops of ore in these directions. I enclose a report from Capt. Rowe, respecting his recent visit to the mine, written at my request. I wish to call especial attention to the fact that the stopes are in better order than when the tributers commenced. Capt. Rowe estimates this improvement at the value of 200*l.* His remarks respecting our recent discoveries are also interesting and encouraging."

Capt. Rowe, the Provincial Government mine agent, wrote—

Auckland, Aug. 27.—In reply to yours of the 25th inst., requesting me to report to you on the position in which I found affairs on my recent visit to the Otea Copper Mines, I have to state that the tributers, under the circumstances in which they have been placed, have done full justice to the mine. The stopes are in much better working order than on my previous visit—in fact, the tributers have been driving and opening ground, and preparing for future operations, and so soon as they have communicated the present level with the winze sunk by Capt. Higgins they will be in a much better position for breaking ore than they have been heretofore, and I have no doubt but that the returns in future will compare very favourably with the past three months. The mine may, I think, be safely entrusted to them for another period; I had not time to minutely examine the dressing operations. The alterations made appear to be in the right direction, but considerable improvement may, I think, still be made. I spent some time in examining the new lode, both in the level driven by Capt. Higgins (upper lode), and also in the gorge above Mine Bay (middle lode). In both places it exhibits encouraging appearances, and from both positions I obtained some good specimens of ore. The ground in the level above referred to is very congenial for copper, and I am of opinion that you are fully warranted in prosecuting further researches on this lode, as any discoveries made in this direction must be of a permanent character, the lode running through the whole length of the company's property, and also through a considerable portion of the property of the Great Barrier Company. The present level should be continued, and the outcrop of the lode be traced in the intervening gorges between it and the sea. Upon the whole, I have felt very much pleased in my late visit with the improved aspect of things at the mine, and hope you may soon be in a position to prosecute the operations with greater vigour and effect.—W. ROWE.

The CHAIRMAN, in reply to a Shareholder, stated that the debit balance at present was about 6400*l.*, against which they have a large quantity of ore discovered, and the stopes holding out every appearance of an increased return. There was, also, the new lode, which had recently been discovered; there was the plant, which had cost 3800*l.*; the ore at surface, and the value of the land, &c. It was most painful to ask the shareholders to wind-up under the present favourable aspect of the mine, but there was no other course to adopt. After some discussion, it was resolved that the present company be wound-up, and five shareholders were appointed liquidators to carry out that resolution, and that a special meeting be held on Nov. 28, to confirm that resolution. It was also understood that in the meantime a plan for reconstituting the company should be considered and laid before the shareholders.

A vote of thanks to the Chairman terminated the proceedings.

WEST ST. IVES MINING COMPANY.

The ordinary general meeting of shareholders was held at the company's offices, Bishopsgate-street, on Thursday,

Mr. W. F. STREET in the chair.

Mr. G. STILL (the secretary) having read the notice convening the meeting, the following reports from the agents were read:—

Oct. 29.—The horse of killas that has disordered No. 1 lode is almost worn out, and the lode now presents a strong and very congenial appearance, producing good work for tin, and spotted with rich yellow copper ore, and, in my opinion, is a lode very likely to yield great quantities of tin. No. 2 lode is also a lode of great promise, and is to be seen in the cliff, from which great quantities of tinstone has crushed away, and from assay will pay for returning. I advise that immediate operations be commenced on this lode, as it can be so cheaply tried by an adit level. Really I do not see a young mine in this county that deserves a more spirited development than this, or that is better situated, being in a parallel line with the celebrated St. Ives Consols, Rosewall Hill and Ransom United, Wheal Providence, and Wheal Margery, which are too well known to need commenting on. My decided opinion is that if West St. Ives Mine is properly developed it will not be second to any of the rich mines adjoining. It can be easily tried, as there is no steam-power required, and the ground is very easily explored.—JAMES EVANS.

Oct. 30.—The horse of killas which I mentioned in my last in the lode is almost gone. We have a very pretty lode coming in, from 3 to 4 feet wide, producing capital stones of tin and copper, which seems to testify we shall have a good lode at the point. In driving a short distance further we shall cut the cross-lode, where we expect a far greater improvement. In looking at the present indications it will make one of the best mines in the neighbourhood.—T. UREN.

The statement of accounts showed—Eight months' labour cost 234*l.* 14s. 2d.; merchants' bills and preliminary expenses, 44*l.* 10s. 11d.=279*l.* 5s. 1d.—Calls received, 300*l.*: leaving a credit balance of 20*l.* 14s. 11d.

The CHAIRMAN was glad to meet the shareholders, and from the report just read it would be seen that their prospects were very encouraging; and, looking at the surrounding mines, he had every reason to encourage the most favourable anticipations.—A SHAREHOLDER observed that as there was a credit balance in favour of the company, and bearing in mind the ore which had yet to be sold, it was most gratifying to know that no call would be required.

Mr. H. E. WHEELER asked who were the trustees for the company, and under what conditions the sett was held?

The SECRETARY then produced the necessary legal document setting forth the names of the trustees, and the terms under which the property is held.

Mr. J. B. REYNOLDS stated that he was quite sure the secretary would be glad to afford the shareholders every possible information; and expressed himself highly pleased with the position of the mine, and the manner in which the accounts were kept.

A vote of thanks to the Chairman terminated the proceedings.

GREAT SOUTH CHIVERTON MINING COMPANY.

The quarterly general meeting of shareholders was held at the company's office, Bucklersbury, on Wednesday,

Mr. W. CARPENTER in the chair.

Mr. H. CHAPMAN (the secretary) having read the notice convening the meeting, the minutes of the last were confirmed.

The agents' report was read, as follows:—

Oct. 29.—Since the last general meeting, we have cut a plat at the 40, and have sunk Gifford's engine-shaft 6½ fms. below; the lode in this sinking has varied from 4 to 7 ft. wide—carried a strong flookan, mixed with fine mundic, and contained a great deal of carbonate of lime, and occasionally a little copper, altogether having a most promising appearance for lead. This shaft will at our present rate of sinking be down to the 50 in from six to eight weeks, when we shall immediately commence driving east and west. The 30 is driven 22½ fms. west on the south lode, which maintains its size, and presents all the appearance of becoming productive in depth. The cross-cut has been driven north at the nearly 3 fms. beyond the north lode, but nothing further has been discovered and the winze below the 30 not being drained, we resumed the driving west on the lode, and have driven 5 fms.; the lode improves in appearance, and looks as if it would shortly reach the ore ground gone below the 20. This driving is only partially drained the winze above. Owing to the water there has been a little sunk in the above-mentioned winze since the last meeting, but the sinking was resumed a fortnight ago; the copper and mundic continue, but dip fall to the westward, and there is a good prospect of our getting into lead in sinking a little further. The 20 is driven 44 fms. east in a good looking lode, which month since yielded a little lead, and is likely to improve, as we think it may shortly intersect a cross-course, and there is strong evidence of a very poor lode being just before us. The ore ground gone below the 20 has dipped much faster than was at first supposed, or we should have reached it in the before this time, but think it cannot be far distant, and are pushing on the towards it as fast as possible. We shall soon commence a cross-cut towards the lode at the 40, and when reached drive east and west. This shoot of ore is a point of great interest and importance, as is also the 20 east, which is being driven into ground parallel with the great courses of lead in West Chiverton, and from the appearance of the lodes, and the stratum in which they are embedded, they are likely to be equally productive here.—J. NANCARROW, J. GEORGE.

The accounts for three months showed a debit balance of 341*l.* 0s. 6

The CHAIRMAN, in moving the adoption of the report and accounts, said that the financial position of the company required that a call of 3s. per share should be made at the present meeting. The operations had been carried on as fast as possible, with the greatest regard to economy, and he proposed that a call of 3s. per share be made.

Mr. LELEAN, in seconding the resolution, stated that he had had the mine inspected by an independent agent during the past month, and he was pleased to say that he had given a very satisfactory account of the mine, both as regards its position and prospects, and the mode in which the work had been carried on. He felt very sanguine that in a short time good results would be realised, as the strata and lodes are precisely similar to those of West Chiverton at the same depth.

Mr. MILFORD, as a member of the committee who had visited the mine, could not but congratulate the shareholders on the improved position of the property. From what he had seen there could not be any doubt but that Great South Chiverton Mine would repay all those who have embarked their capital in it. Time only was required to bring it into a good paying condition. Mining, as a rule, is to a certain extent speculative, but from what he (Mr. Milford) had heard and seen of this mine, it appeared only to be a question of time.

The motion that a call of 3s. per share be made was then carried, and the committee were re-elected for the next three months. A vote of thanks to the Chairman terminated the proceedings.

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